Grade 8 | Indiana 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

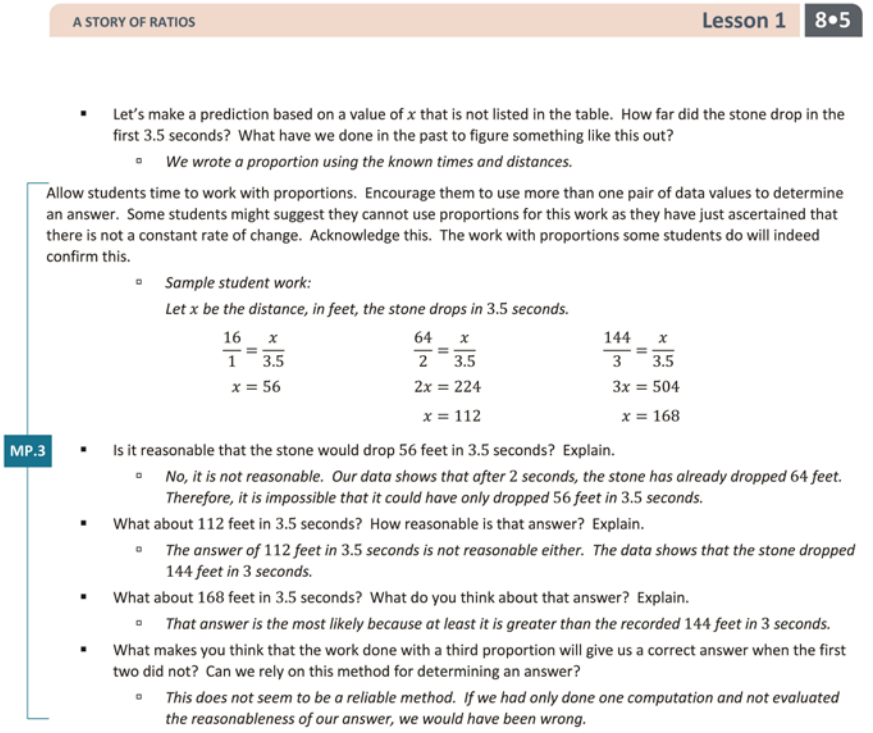
Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

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

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

Number Sense

Students continue to deepen their understanding of rational and irrational numbers by explaining the differences between them and solving real-world problems.

Indiana Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.NS.1 Give examples of rational and irrational numbers, and explain the difference between them. State decimal equivalents for any number. For rational numbers, show that the decimal equivalent terminates or repeats, and convert a repeating decimal into a rational number.	G7 M2 Lesson 14: Converting Rational Numbers to Decimals Using Long Division G8 M7 Topic B: Decimal Expansions of Numbers
8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, plot them approximately on a number line, and estimate the value of expressions involving irrational numbers.	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
8.NS.3 Given a numeric expression with common rational number bases and integer exponents, apply the properties of exponents to generate equivalent expressions. (E)	G8 M1 Topic A: Exponential Notation and Properties of Integer Exponents

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8.NS.4 Solve real-world problems with rational numbers by using multiple operations. (E)	G7 M2 Lesson 18: Writing, Evaluating, and Finding Equivalent Expressions with Rational Numbers G7 M2 Lesson 19: Writing, Evaluating, and Finding Equivalent Expressions with Rational Numbers G7 M2 Lesson 20: Investments—Performing Operations with Rational Numbers

Algebra and Functions

Students understand the formal definition of a function, analyze linear functions in multiple representations, and differentiate between linear and nonlinear functions. Students also solve a system of linear equations in two unknowns.

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8.AF.1 Solve linear equations and inequalities with rational number coefficients fluently, including those whose solutions require expanding expressions using the distributive property and collecting like terms. Represent real-world problems using linear equations and inequalities in one variable and solve such problems. (E)	G8 M4 Topic A: Writing and Solving Linear Equations
8.AF.2 Generate linear equations in one variable with one solution, infinitely many solutions, or no solutions. Justify the classification given.	G8 M4 Lesson 7: Classification of Solutions

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8.AF.3 Understand that a function assigns to each x-value (independent variable) exactly one y-value (dependent variable), and that the graph of a function is the set of ordered pairs (x, y).	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.AF.4 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described. (E)	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
8.AF.5 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. Describe similarities and differences between linear and nonlinear functions from tables, graphs, verbal descriptions, and equations.	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 G8 M6 Lesson 4: Increasing and Decreasing Functions G8 M6 Lesson 5: Increasing and Decreasing Functions

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8.AF.6 Construct a function to model a linear relationship between two quantities given a verbal description, table of values, or graph. Within the context of a problem, describe the meaning of m (rate of change) and b (y-intercept) in $y = mx + b$. (E)	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 G8 M6 Lesson 4: Increasing and Decreasing Functions
8.AF.7 Compare properties of two linear functions given in different forms, such as a table of values, equation, verbal description, and graph (e.g., compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed).	G8 M5 Lesson 7: Comparing Linear Functions and Graphs
8.AF.8 Approximate the solution of a system of equations by graphing and interpreting the reasonableness of the approximation. (E)	G8 M4 Lesson 24: Introduction to Simultaneous Equations G8 M4 Lesson 25: Geometric Interpretation of the Solutions of a Linear System G8 M4 Lesson 27: Nature of Solutions of a System of Linear Equations G8 M4 Lesson 28: Another Computational Method of Solving a Linear System

Geometry and Measurement

Students explore transformations in the coordinate plane and are also expected to understand and explain the Pythagorean Theorem, its converse, and to use this relationship to solve problems and find distance on the coordinate plane.

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8.GM.1 Explore dilations, translations, rotations, and reflections on two-dimensional figures in the coordinate plane. (E)	G8 M2 Topic A: Definitions and Properties of the Basic Rigid Motions G8 M2 Topic B: Sequencing the Basic Rigid Motions G8 M3 Topic A: Dilation G8 M3 Lesson 8: Similarity
8.GM.2 Solve real-world and other mathematical problems involving volume of cones, spheres, and pyramids and surface area of spheres. (E)	G8 M5 Lesson 10: Volumes of Familiar Solids—Cones and Cylinders G8 M5 Lesson 11: Volume of a Sphere G8 M7 Lesson 19: Cones and Spheres G8 M7 Lesson 20: Truncated Cones Geometry M3 Lesson 11: The Volume Formula of a Pyramid and Cone Geometry M3 Lesson 12: The Volume Formula of a Sphere *Supplemental material is necessary to address solving problems involving surface areas of spheres.*
8.GM.3 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and other mathematical problems in two dimensions. (E)	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 Topic C: The Pythagorean Theorem G8 M7 Lesson 19: Cones and Spheres G8 M7 Lesson 23: Nonlinear Motion

Data Analysis, Statistics, and Probability

Students begin to investigate and represent bivariate data using scatter plots. They build on their experience with univariate data. Students also build on the probability work in grade seven to examine and represent the probability and compound events.

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8.DSP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantitative variables. 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.DSP.2 Write and use equations that model linear relationships to make predictions, including interpolation and extrapolation, in real-world situations involving bivariate measurement data. Interpret the slope and y-intercept in context. (E)	G8 M6 Lesson 8: Informally Fitting a Line G8 M6 Lesson 9: Determining the Equation of a Line Fit to Data G8 M6 Topic C: Linear and Nonlinear Models
8.DSP.3 Represent sample spaces and find probabilities of compound events (independent and dependent) using organized lists, tables, and tree diagrams. (E)	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

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8.DSP.4 Define the probability of a compound event, just as with simple events, as the fraction of outcomes in the sample space for which the compound event occurs. Use appropriate terminology to describe independent, dependent, complementary, and mutually exclusive events. (E)	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 *Supplemental material is necessary to address using appropriate terminology to describe independent, dependent, complementary, and mutually exclusive events.*
8.DSP.5 For events with a large number of outcomes, understand the use of the multiplication counting principle. Develop the multiplication counting principle, and apply it to situations with a large number of outcomes.	*Supplemental material is necessary to address this standard.*