Grade 7 | 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 connect earlier learning to express the prime factorization of whole numbers using exponents, understand the inverse relationship between perfect squares and square roots, and use number lines to compare and order rational and irrational numbers.

Indiana Academic Standards for Mathematics	Aligned Components of *Eureka Math*
7.NS.1 Show on a number line that a number and its opposite have a sum of 0 (are additive inverses). Find and interpret sums of rational numbers in real-world contexts.	G7 M2 Lesson 1: Opposite Quantities Combine to Make Zero G7 M2 Lesson 2: Using the Number Line to Model the Addition of Integers G7 M2 Lesson 3: Understanding Addition of Integers G7 M2 Lesson 4: Efficiently Adding Integers and Other Rational Numbers G7 M2 Lesson 7: Addition and Subtraction of Rational Numbers G7 M2 Lesson 8: Applying the Properties of Operations to Add and Subtract Rational Numbers G7 M2 Lesson 9: Applying the Properties of Operations to Add and Subtract Rational Numbers
7.NS.2 Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	G7 M2 Lesson 5: Understanding Subtraction of Integers and Other Rational Numbers G7 M2 Lesson 6: The Distance Between Two Rational Numbers G7 M2 Lesson 7: Addition and Subtraction of Rational Numbers G7 M2 Lesson 8: Applying the Properties of Operations to Add and Subtract Rational Numbers G7 M2 Lesson 9: Applying the Properties of Operations to Add and Subtract Rational Numbers
7.NS.3 Use the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1)=1$ and the rules for multiplying signed numbers. (E)	G7 M2 Lesson 10: Understanding Multiplication of Integers G7 M2 Lesson 11: Develop Rules for Multiplying Signed Numbers G7 M2 Lesson 15: Multiplication and Division of Rational Numbers

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7.NS.4 Explain that if p and q are integers, then $-\left(\frac{p}{q}\right) = \frac{-p}{q} = \frac{p}{-q}$ for all nonzero integers. (E)	G7 M2 Lesson 12: Division of Integers G7 M2 Lesson 15: Multiplication and Division of Rational Numbers G7 M2 Lesson 16: Applying the Properties of Operations to Multiply and Divide Rational Numbers
7.NS.5 Find the prime factorization of whole numbers and write the results using exponents.	*Supplemental material is necessary to address this standard.*
7.NS.6 Apply the inverse relationship between squaring and finding the square root of a perfect square whole number. Find square roots of perfect square whole numbers.	G8 M7 Lesson 2: Square Roots G8 M7 Lesson 5: Solving Equations with Radicals G8 M7 Lesson 10: Converting Repeating Decimals to Fractions
7.NS.7 Compute fluently with rational numbers using an algorithmic approach. (E)	G7 M2 Topic A: Addition and Subtraction of Integers and Rational Numbers G7 M2 Topic B: Multiplication and Division of Integers and Rational Numbers 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 G7 M2 Lesson 21: If-Then Moves with Integer Number Cards

Ratios and Proportional Reasoning

Students continue to use ratio and rate language, compute using unit rates, and use proportional relationships to solve real-world problems involving ratios and percents.

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7.RP.1 Identify the unit rate or constant of proportionality in tables, graphs, equations, and verbal descriptions of proportional relationships.	G7 M1 Topic A: Proportional Relationships G7 M1 Topic B: Unit Rate and Constant of Proportionality G7 M1 Lesson 11: Ratios of Fractions and Their Unit Rates G7 M1 Lesson 12: Ratios of Fractions and Their Unit Rates G7 M1 Lesson 13: Finding Equivalent Ratios Given the Total Quantity G7 M1 Lesson 15: Equations of Graphs of Proportional Relationships Involving Fractions G7 M1 Lesson 16: Relating Scale Drawings to Ratios and Rates G7 M1 Lesson 17: The Unit Rate as the Scale Factor
7.RP.2 Use proportional relationships to solve ratio and percent problems with multiple operations (e.g., simple interest, tax, markups, markdowns, gratuities, conversions within and across measurement systems, and percent increase and decrease). (E)	G7 M1 Lesson 14: Multi-Step Ratio Problems G7 M4 Topic A: Finding the Whole G7 M4 Topic B: Percent Problems Including More Than One Whole G7 M4 Topic D: Population, Mixture, and Counting Problems Involving Percents

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7.RP.3 Represent real-world and other mathematical situations that involve proportional relationships. Write equations and draw graphs to represent these proportional relationships. Apply the definition of unit rate to $y = mx$. (E)	G7 M1 Topic A: Proportional Relationships G7 M1 Topic B: Unit Rate and Constant of Proportionality G7 M1 Lesson 15: Equations of Graphs of Proportional Relationships Involving Fractions G7 M1 Lesson 16: Relating Scale Drawings to Ratios and Rates G7 M1 Lesson 17: The Unit Rate as the Scale Factor G7 M4 Lesson 1: Percent G7 M4 Lesson 2: Part of a Whole as Percent G7 M4 Lesson 3: Comparing Quantities with Percent G7 M4 Lesson 4: Percent Increase and Decrease G7 M4 Lesson 6: Fluency with Percents G7 M4 Topic B: Percent Problems Including More Than One Whole G7 M4 Lesson 12: The Scale Factor as a Percent for a Scale Drawing G7 M4 Lesson 15: Solving Area Problems Using Scale Drawings G7 M4 Topic D: Population, Mixture, and Counting Problems Involving Percents 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

Algebra and Functions

Students use two variable equations, as well as graphs and tables, to model real-world proportional relationships and connect the constant of proportionality to the idea of slope.

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7.AF.1 Apply the properties of operations (e.g., identity, inverse, commutative, associative, distributive properties) to create equivalent linear expressions, including situations that involve factoring out a common number (e.g., given $2x - 10$, create an equivalent expression $2(x - 5)$). Justify each step in the process. (E)	G7 M3 Topic A: Use Properties of Operations to Generate Equivalent Expressions
7.AF.2 Solve real-world problems with rational numbers by using one or two 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 G7 M2 Lesson 21: If-Then Moves with Integer Number Cards G7 M3 Lesson 3: Writing Products as Sums and Sums as Products G7 M3 Lesson 4: Writing Products as Sums and Sums as Products G7 M3 Lesson 7: Understanding Equations G7 M3 Lesson 8: Using If-Then Moves in Solving Equations G7 M3 Lesson 9: Using If-Then Moves in Solving Equations G7 M3 Lesson 10: Angle Problems and Solving Equations G7 M3 Lesson 11: Angle Problems and Solving Equations G7 M3 Lesson 13: Inequalities G7 M3 Lesson 14: Solving Inequalities

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7.AF.2 *continued*	G7 M3 Lesson 15: Graphing Solutions to Inequalities
	G7 M4 Lesson 7: Markup and Markdown Problems
	G7 M4 Lesson 8: Percent Error Problems
	G7 M4 Lesson 9: Problem Solving When the Percent Changes
	G7 M4 Topic D: Population, Mixture, and Counting Problems Involving Percents
7.AF.3 Solve equations of the form $px + q = r$ and $p(x + q) = r$ fluently, where p, q, and r are specific rational numbers. Represent real-world problems using equations of these forms and solve such problems. (E)	G7 M2 Lesson 17: Comparing Tape Diagram Solutions to Algebraic Solutions
	G7 M2 Lesson 21: If-Then Moves with Integer Number Cards
	G7 M2 Lesson 22: Solving Equations Using Algebra
	G7 M2 Lesson 23: Solving Equations Using Algebra
	G7 M3 Topic B: Solve Problems Using Expressions, Equations, and Inequalities
	G7 M4 Lesson 10: Simple Interest
	G7 M4 Lesson 11: Tax, Commissions, Fees, and Other Real-World Percent Applications
	G7 M4 Lesson 17: Mixture Problems
7.AF.4 Solve inequalities of the form $px + q$ ($>$ or $\geq$) r or $px + q$ ($<$ or $\leq$) r, where p, q, and r are specific rational numbers. Represent real-world problems using inequalities of these forms and solve such problems. Graph the solution set of the inequality and interpret it in the context of the problem.	G7 M3 Lesson 12: Properties of Inequalities
	G7 M3 Lesson 13: Inequalities
	G7 M3 Lesson 14: Solving Inequalities

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7.AF.5 Define slope as vertical change for each unit of horizontal change, and apply that a constant rate of change or constant slope describes a linear function. Identify and describe situations with constant or varying rates of change.	G7 M1 Lesson 10: Interpreting Graphs of Proportional Relationships G8 M4 Topic B: Linear Equations in Two Variables and Their Graphs G8 M4 Topic C: Slope and Equations of Lines G8 M4 Lesson 24: Introduction to Simultaneous Equations
7.AF.6 Graph a line given its slope and a point on the line. Find the slope of a line given its graph. (E)	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

Geometry and Measurement

Students use scale drawings, the area and circumference of circles, and the volume of cylinders and other three-dimensional solids to solve real-world problems.

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7.GM.1 Solve real-world and other mathematical problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing. Create a scale drawing by using proportional reasoning.	G7 M1 Lesson 17: The Unit Rate as the Scale Factor G7 M1 Lesson 18: Computing Actual Lengths from a Scale Drawing G7 M1 Lesson 19: Computing Actual Areas from a Scale Drawing G7 M1 Lesson 20: An Exercise in Creating a Scale Drawing G7 M1 Lesson 21: An Exercise in Changing Scales G7 M1 Lesson 22: An Exercise in Changing Scales G7 M4 Topic C: Scale Drawings
7.GM.2 Understand the formulas for area and circumference of a circle and use them to solve real-world and other mathematical problems; give an informal derivation of the relationship between circumference and area of a circle.	G7 M3 Lesson 16: The Most Famous Ratio of All G7 M3 Lesson 17: The Area of a Circle G7 M3 Lesson 18: More Problems on Area and Circumference G7 M3 Lesson 20: Composite Area Problems
7.GM.3 Solve real-world and other mathematical problems involving volume of cylinders and three-dimensional objects composed of right rectangular prisms. (E)	G7 M3 Lesson 23: The Volume of a Right Prism G7 M3 Lesson 24: The Volume of a Right Prism G7 M3 Lesson 25: Volume and Surface Area G7 M3 Lesson 26: Volume and Surface Area G7 M6 Topic D: Problems Involving Area and Surface Area G7 M6 Topic E: Problems Involving Volume

Data Analysis, Statistics, and Probability
Students make inferences about populations through sampling and learn about the importance of representative samples.

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7.DSP.1 Understand that statistics can be used to gain information about a population by examining a sample of the population. Understand that conclusions and generalizations about a population from a sample are valid only if the sample is representative of that population and that random sampling tends to produce representative samples and support valid inferences. (E)	G7 M5 Topic C: Random Sampling and Estimating Population Characteristics
7.DSP.2 Find, use, and interpret measures of central tendency (mean and median) and measures of spread (range, interquartile range, and mean absolute deviation) for numerical data from random samples to draw comparative inferences about two populations. (E)	G7 M5 Topic D: Comparing Populations

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7.DSP.3 Make observations about the degree of visual overlap of two numerical data distributions represented in line plots or box plots. Describe how data, particularly outliers, added to a data set may affect the mean and/or median.	G7 M5 Topic D: Comparing Populations
7.DSP.4 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Understand that a probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. Understand that a probability of 1 indicates an event certain to occur and a probability of 0 indicates an event impossible to occur. Identify probabilities of events as impossible, unlikely, equally likely, likely, or certain. (E)	G7 M5 Lesson 1: Chance Experiments

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7.DSP.5 Develop probability models that include the sample space and probabilities of outcomes to represent simple events with equally likely outcomes. Predict the approximate relative frequency of the event based on the model. Compare probabilities from the model to observed frequencies, evaluate the level of agreement, and explain possible sources of discrepancy. (E)	G7 M5 Lesson 2: Estimating Probabilities by Collecting Data G7 M5 Lesson 3: Chance Experiments with Equally Likely Outcomes G7 M5 Lesson 4: Calculating Probabilities for Chance Experiments with Equally Likely Outcomes G7 M5 Lesson 5: Chance Experiments with Outcomes That Are Not Equally Likely G7 M5 Lesson 8: The Difference Between Theoretical Probabilities and Estimated Probabilities G7 M5 Lesson 9: Comparing Estimated Probabilities to Probabilities Predicted by a Model G7 M5 Lesson 12: Applying Probability to Make Informed Decisions