



# Grade 4 | Indiana Academic Standards for Mathematics Correlation to Eureka Math<sup>2™</sup>

When the original *Eureka Math*® curriculum was released, it quickly became the most widely used K-5 mathematics curriculum in the country. Now, the Great Minds® teacher-writers have created *Eureka Math*<sup>2™</sup>, a groundbreaking new curriculum that helps teachers deliver *exponentially better* math instruction while still providing students with the same deep understanding of and fluency in math. *Eureka Math*<sup>2</sup> carefully sequences mathematical content to maximize vertical alignment—a principle tested and proven to be essential in students' mastery of math—from kindergarten through high school.

While this innovative new curriculum includes all the trademark Eureka Math aha moments that have been delighting students and teachers for years, it also boasts these exciting new features:

# **Teachability**

Eureka Math<sup>2</sup> 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 right into the teacher materials.

# **Accessibility**

Eureka Math² incorporates Universal Design for Learning principles so all learners can access the mathematics and take on challenging math concepts. Student supports are built into the instructional design and are clearly identified in the Teach book. Further, the curriculum carries a focus on readability. By eliminating unnecessary words and using simple, 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.

# **Digital Engagement**

The digital elements of *Eureka Math*<sup>2</sup> add to students' engagement with the math. The curriculum provides teachers with digital slides for each lesson. In addition, each grade level includes wordless videos that spark students' interest and curiosity. Students at all levels work through mathematical explorations that help lead to their own mathematical discoveries. Digital lessons and videos provide opportunities for students to wonder, explore, and make sense of mathematics, which contributes to the development of a strong, positive mathematical identity.

# PS.1: Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway, rather than simply jumping into a solution attempt. They consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" and "Is my answer reasonable?" They understand the approaches of others to solving complex problems and identify correspondences between different approaches. Mathematically proficient students understand how mathematical ideas interconnect and build on one another to produce a coherent whole.

# Aligned Components of Eureka Math<sup>2</sup>

While lessons in every module engage students in making sense of problems and persevering in solving them, this mathematical practice is specifically addressed in the following modules:

- 4 M3: Multiplication and Division of Multi-Digit Numbers
- 4 M4: Foundations for Fraction Operations

# PS.2: Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

While lessons in every module engage students in reasoning abstractly and quantitatively, this mathematical practice is specifically addressed in the following modules:

- 4 M5: Place Value Concepts for Decimal Fractions
- 4 M6: Angle Measurements and Plane Figures

# PS.3: Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They analyze situations by breaking them into cases and recognize and use counterexamples. They organize their mathematical thinking, justify their conclusions and communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. They justify whether a given statement is true always, sometimes, or never. Mathematically proficient students participate and collaborate in a mathematics community. They listen to or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

# Aligned Components of Eureka Math<sup>2</sup>

While lessons in every module engage students in constructing viable arguments and critiquing the reasoning of others, this mathematical practice is specifically addressed in the following modules:

- 4 M2: Place Value Concepts for Multiplication and Division
- 4 M4: Foundations for Fraction Operations

#### PS.4: Model with mathematics.

Mathematically proficient students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace using a variety of appropriate strategies. They create and use a variety of representations to solve problems and to organize and communicate mathematical ideas. Mathematically proficient students apply what they know and are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

# Aligned Components of Eureka Math<sup>2</sup>

While lessons in every module engage students in modeling with mathematics, this mathematical practice is specifically addressed in the following modules:

- 4 M1: Place Value Concepts for Addition and Subtraction
- 4 M4: Foundations for Fraction Operations

# PS.5: Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Mathematically proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. Mathematically proficient students identify relevant external mathematical resources, such as digital content, and use them to pose or solve problems. They use technological tools to explore and deepen their understanding of concepts and to support the development of learning mathematics. They use technology to contribute to concept development, simulation, representation, reasoning, communication and problem solving.

While lessons in every module engage students in using appropriate tools strategically, this mathematical practice is specifically addressed in the following modules:

- 4 M3: Multiplication and Division of Multi-Digit Numbers
- 4 M4: Foundations for Fraction Operations

# Aligned Components of Eureka Math<sup>2</sup>

#### PS.6: Attend to precision.

Mathematically proficient students communicate precisely to others. They use clear definitions, including correct mathematical language, in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They express solutions clearly and logically by using the appropriate mathematical terms and notation. They specify units of measure and label axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently and check the validity of their results in the context of the problem. They express numerical answers with a degree of precision appropriate for the problem context.

While lessons in every module engage students in attending to precision, this mathematical practice is specifically addressed in the following modules:

- 4 M1: Place Value Concepts for Addition and Subtraction
- 4 M2: Place Value Concepts for Multiplication and Division
- 4 M3: Multiplication and Division of Multi-Digit Numbers
- 4 M6: Angle Measurements and Plane Figures

#### PS.7: Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. They step back for an overview and shift perspective. They recognize and use properties of operations and equality. They organize and classify geometric shapes based on their attributes. They see expressions, equations, and geometric figures as single objects or as being composed of several objects.

While lessons in every module engage students in looking for and making use of structure, this mathematical practice is specifically addressed in the following modules:

- 4 M1: Place Value Concepts for Addition and Subtraction
- 4 M2: Place Value Concepts for Multiplication and Division
- 4 M4: Foundations for Fraction Operations
- 4 M5: Place Value Concepts for Decimal Fractions

# PS.8: Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated and look for general methods and shortcuts. They notice regularity in mathematical problems and their work to create a rule or formula. Mathematically proficient students maintain oversight of the process, while attending to the details as they solve a problem. They continually evaluate the reasonableness of their intermediate results.

While lessons in every module engage students in looking for and expressing regularity in repeated reasoning, this mathematical practice is specifically addressed in the following modules:

4 M4: Foundations for Fraction Operations

Strands	Indiana Academic Standards for Mathematics	Aligned Components of Eureka Math <sup>2</sup>
Number Sense	4.NS.1	4 M1 Topic B: Place Value and Comparison Within 1,000,000
	Read and write whole numbers up to $1,000,000$ . Use words, models, standard form and expanded form to represent and show equivalent forms of whole numbers up to $1,000,000$ .	4 M1 Lesson 10: Name numbers by using place value understanding.
		4 M1 Lesson 11: Find $1,10,\mathrm{and}100$ thousand more than and less than a given number.
	4.NS.2	4 M1 Lesson 9: Compare numbers within 1,000,000 by using
	Compare two whole numbers up to $1,000,000$ using $>$ , =, and $<$ symbols.	>, =, and <.
	4.NS.3	4 M4 Topic A: Fraction Decomposition and Equivalence
	Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. Name and write mixed numbers using objects or pictures. Name and write mixed numbers as improper fractions using objects or pictures.	
	4.NS.4	4 M4 Topic B: Equivalent Fractions
	Explain why a fraction, $\frac{a}{b}$ , is equivalent to a fraction, $\frac{n \times a}{n \times b}$ , by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. [In grade 4, limit denominators of fractions to 2, 3, 4, 5, 6, 8, 10, 25, 100.]	4 M5 Topic B: Tenths and Hundredths

Indiana Academic Standards for Mathematics		Aligned Components of Eureka Math <sup>2</sup>
	<b>4.NS.5</b> Compare two fractions with different numerators and different denominators (e.g., by creating common denominators or numerators, or by comparing to a benchmark, such as $0, \frac{1}{2}$ , and 1). Recognize comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$ , $=$ , or $<$ , and justify the conclusions (e.g., by using a visual fraction model).	4 M4 Topic C: Compare Fractions
	<b>4.NS.6</b> Write tenths and hundredths in decimal and fraction notations. Use words, models, standard form and expanded form to represent decimal numbers to hundredths. Know the fraction and decimal equivalents for halves and fourths (e.g., $\frac{1}{2} = 0.5 = 0.50, \frac{7}{4} = 1\frac{3}{4} = 1.75$ ).	4 M5 Topic A: Exploration of Tenths 4 M5 Topic B: Tenths and Hundredths
	<b>4.NS.7</b> Compare two decimals to hundredths by reasoning about their size based on the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions (e.g., by using a visual model).	4 M5 Topic C: Comparison of Decimal Numbers
	4.NS.8  Find all factor pairs for a whole number in the range 1–100.  Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number.	4 M2 Topic E: Factors and Multiples
	4.NS.9  Use place value understanding to round multi-digit whole numbers to any given place value.	4 M1 Topic C: Rounding Multi-Digit Whole Numbers

**Strands** 

Strands	Indiana Academic Standards for Mathematics	Aligned Components of Eureka Math <sup>2</sup>
Computation	<b>4.C.1</b> Add and subtract multi-digit whole numbers fluently using a standard algorithmic approach.	4 M1 Topic D: Multi-Digit Whole Number Addition and Subtraction
	<b>4.C.2</b> Multiply a whole number of up to four digits by a one-digit	4 M2 Lesson 1: Multiply multiples of 10 by one-digit numbers by using the associative property of multiplication.
	whole number and multiply two two-digit numbers, using strategies based on place value and the properties	4 M2 Topic B: Multiplication of Tens and Ones by One-Digit Numbers
	of operations. Describe the strategy and explain the reasoning.	4 M3 Lesson 2: Multiply by multiples of 100 and 1,000.
		4 M3 Lesson 3: Multiply a two-digit multiple of $10$ by a two-digit multiple of $10$ .
		4 M3 Topic C: Multiplication of up to Four-Digit Numbers by One-Digit Numbers
		4 M3 Topic D: Multiplication of Two-Digit Numbers by Two-Digit Numbers
	4.C.3	4 M2 Lesson 2: Divide two- and three-digit multiples of 10
	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Describe the strategy and explain the reasoning.	by one-digit numbers.
		4 M2 Topic C: Division of Tens and Ones by One-Digit Numbers
		4 M3 Lesson 1: Divide multiples of 100 and 1,000.
		4 M3 Topic B: Division of Thousands, Hundreds, Tens, and Ones
		4 M3 Lesson 21: Find whole-number quotients and remainders.
		4 M3 Lesson 22: Represent, estimate, and solve division word problems.

Strands	Indiana Academic Standards for Mathematics	Aligned Components of Eureka Math <sup>2</sup>
	4.C.4	3 M1: Multiplication and Division with Units of 2, 3, 4, 5, and 10
	Multiply fluently within 100.	3 M3: Multiplication and Division with Units of $0, 1, 6, 7, 8$ , and $9$
		3 M6 Lesson 26: Fluently multiply and divide within $100\mathrm{and}$ add and subtract within $1{,}000.$
		4 M1 Topic A: Multiplication as Multiplicative Comparison
		4 M2 Topic E: Factors and Multiples
	4.C.5	4 M4 Topic A: Fraction Decomposition and Equivalence
	Add and subtract fractions with common denominators.  Decompose a fraction into a sum of fractions with common denominators. Understand addition and subtraction	4 M4 Lesson 7: Rename fractions as a sum of equivalent smaller unit fractions.
		4 M4 Topic D: Add and Subtract Fractions
	of fractions as combining and separating parts referring to the same whole.	4 M5 Topic D: Addition of Tenths and Hundredths
	4.C.6	4 M4 Topic E: Add and Subtract Mixed Numbers
	Add and subtract mixed numbers with common denominators (e.g., by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction).	

# Strands Indiana Academic Standards for Mathematics 4.C.7

Show how the order in which two numbers are multiplied (commutative property) and how numbers are grouped in multiplication (associative property) will not change the product. Use these properties to show that numbers can be multiplied in any order. Understand and use the distributive property.

# Aligned Components of Eureka Math<sup>2</sup>

- 4 M2 Lesson 1: Multiply multiples of 10 by one-digit numbers by using the associative property of multiplication.
- 4 M2 Lesson 3: Investigate and use a formula for the area of a rectangle.
- 4 M2 Topic B: Multiplication of Tens and Ones by One-Digit Numbers
- 4 M2 Lesson 21: Find factor pairs for numbers up to  $100\,\mathrm{and}$  use factors to identify numbers as prime or composite.
- 4 M2 Lesson 22: Use division and the associative property of multiplication to find factors.
- 4 M2 Lesson 24: Recognize that a number is a multiple of each of its factors.
- 4 M3 Lesson 2: Multiply by multiples of 100 and 1,000.
- 4 M3 Topic C: Multiplication of up to Four-Digit Numbers by One-Digit Numbers
- 4 M3 Topic D: Multiplication of Two-Digit Numbers by Two-Digit Numbers

Strands	Indiana Academic Standards for Mathematics	Aligned Components of Eureka Math <sup>2</sup>
Algebraic Thinking	4.AT.1  Solve real-world problems involving addition and subtraction	4 M1 Lesson 15: Apply estimation to real-world situations by using rounding.
	of multi-digit whole numbers (e.g., by using drawings and	4 M1 Lesson 16: Add by using the standard algorithm.
	equations with a symbol for the unknown number to represent the problem).	4 M1 Lesson 17: Solve multi-step addition word problems by using the standard algorithm.
		4 M1 Lesson 21: Solve two-step word problems by using addition and subtraction.
		4 M1 Lesson 22: Solve multi-step word problems by using addition and subtraction.
	4.AT.2	4 M2 Lesson 9: Solve multiplication word problems.
	Recognize and apply the relationships between addition and multiplication, between subtraction and division, and the inverse relationship between multiplication and division to solve real-world and other mathematical problems.	4 M2 Lesson 10: Multiply by applying simplifying strategies.
		4 M2 Lesson 16: Divide by using the break apart and distribute strategy.
		4 M3 Lesson 18: Express units of time in terms of smaller units.
		4 M3 Topic F: Remainders, Estimating, and Problem Solving
	4.AT.3	4 M1 Topic A: Multiplication as Multiplicative Comparison
	Interpret a multiplication equation as a comparison (e.g., interpret $35 = 5 \times 7$ as a statement that $35$ is $5$ times as many as $7$ , and $7$ times as many as $5$ ). Represent verbal statements of multiplicative comparisons as multiplication equations.	4 M1 Lesson 6: Demonstrate that a digit represents 10 times the value of what it represents in the place to its right.

Strands	Indiana Academic Standards for Mathematics	Aligned Components of Eureka Math <sup>2</sup>
	4.AT.4	4 M1 Topic A: Multiplication as Multiplicative Comparison
	Solve real-world problems with whole numbers involving	4 M2 Lesson 9: Solve multiplication word problems.
	multiplicative comparison (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem), distinguishing multiplicative comparison from additive comparison. [In grade 4, division problems should not include a remainder.]	4 M2 Lesson 20: Solve word problems involving additive and multiplicative comparisons.
	4.AT.5	4 M4 Topic D: Add and Subtract Fractions
	Solve real-world problems involving addition and subtraction	4 M4 Lesson 24: Add a mixed number to a mixed number.
	of fractions referring to the same whole and having common denominators (e.g., by using visual fraction models and	4 M4 Lesson 27: Subtract a mixed number from a mixed number.
	equations to represent the problem).	4 M4 Lesson 28: Represent and solve word problems with mixed numbers by using drawings and equations.
		4 M5 Topic D: Addition of Tenths and Hundredths
	4.AT.6	4 M2 Lesson 26: Use relationships within a pattern to find
	Describe a relationship between two variables and use to find a second number when a first number is given. Generate a number pattern that follows a given rule.	an unknown term in the sequence.

Strands	Indiana Academic Standards for Mathematics	Aligned Components of Eureka Math <sup>2</sup>
Geometry	4.G.1	3 M6 Topic B: Attributes of Two-Dimensional Figures
	Identify, describe, and draw parallelograms, rhombuses, and trapezoids using appropriate tools (e.g., ruler, straightedge and technology).	4 M6 Topic D: Two-Dimensional Figures and Symmetry
	4.G.2	4 M6 Topic D: Two-Dimensional Figures and Symmetry
	Recognize and draw lines of symmetry in two-dimensional figures. Identify figures that have lines of symmetry.	
	4.G.3	4 M6 Topic B: Angle Measurement
	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint.	
	4.G.4	4 M6 Topic A: Lines and Angles
	Identify, describe, and draw rays, angles (right, acute, obtuse), and perpendicular and parallel lines using appropriate tools (e.g., ruler, straightedge and technology). Identify these in two-dimensional figures.	
	4.G.5	4 M6 Topic D: Two-Dimensional Figures and Symmetry
	Classify triangles and quadrilaterals based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles (right, acute, obtuse).	

Strands	Indiana Academic Standards for Mathematics	Aligned Components of Eureka Math <sup>2</sup>
Measurement	<b>4.M.1</b> Measure length to the nearest quarter-inch, eighth-inch, and	3 M5 Lesson 16: Measure lengths and record data on a line plot.
	millimeter	3 M5 Lesson 26: Create a ruler with 1-inch, half-inch, and quarter-inch intervals.
		3 M6 Lesson 19: Measure the perimeter of various circles to the nearest quarter inch by using string.
		Supplemental material is necessary to address measurement to the nearest eighth inch and millimeter.
	4.M.2	4 M1 Topic E: Metric Measurement Conversion Tables
	Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Express measurements in a larger unit in terms of a smaller unit within a single system of measurement. Record measurement equivalents in a two-column table.	4 M2 Lesson 17: Express measurements of length in terms of smaller units.
		4 M3 Topic E: Problem Solving with Measurement
	4.M.3	4 M1 Topic E: Metric Measurement Conversion Tables
	Use the four operations to solve real-world problems involving distances, intervals of time, volumes, masses of objects, and money. Include addition and subtraction problems involving simple fractions and problems that require expressing measurements given in a larger unit in terms of a smaller unit.	4 M2 Lesson 17: Express measurements of length in terms of smaller units.
		4 M2 Lesson 20: Solve word problems involving additive and multiplicative comparisons.
		4 M3 Topic E: Problem Solving with Measurement
		4 M4 Lesson 20: Subtract a fraction from a whole number.
		4 M4 Lesson 21: Solve addition and subtraction word problems and estimate the reasonableness of the answers.
		4 M4 Lesson 27: Subtract a mixed number from a mixed number.
		4 M4 Lesson 28: Represent and solve word problems with mixed numbers by using drawings and equations.

Strands	Indiana Academic Standards for Mathematics	Aligned Components of Eureka Math <sup>2</sup>
	4.M.4  Apply the area and perimeter formulas for rectangles to solve real-world problems and other mathematical problems.  Recognize area as additive and find the area of complex shapes composed of rectangles by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts; apply this technique to solve real-world problems and other mathematical problems.	<ul> <li>4 M2 Lesson 3: Investigate and use a formula for the area of a rectangle.</li> <li>4 M2 Lesson 7: Multiply by using an area model and the distributive property.</li> <li>4 M2 Topic D: Problem Solving with Measurement</li> </ul>
	<b>4.M.5</b> Understand that an angle is measured with reference to a circle, with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. Understand an angle that turns through $\frac{1}{360}$ of a circle is called a "one-degree angle," and can be used to measure other angles. Understand an angle that turns through $n$ one-degree angles is said to have an angle measure of $n$ degrees.	4 M6 Topic B: Angle Measurement
	<b>4.M.6</b> Measure angles in whole-number degrees using appropriate tools. Sketch angles of specified measure.	4 M6 Topic B: Angle Measurement 4 M6 Topic C: Determine Unknown Angle Measures

Strands	Indiana Academic Standards for Mathematics	Aligned Components of Eureka Math <sup>2</sup>
Data Analysis	4.DA.1	3 M6 Topic D: Collecting and Displaying Data
	Formulate questions that can be addressed with data. Use observations, surveys, and experiments to collect, represent, and interpret the data using tables (including frequency tables), line plots, and bar graphs.	4 M4 Lesson 29: Solve problems by using data from a line plot. 4 M4 Lesson 30: Represent data on a line plot.
	4.DA.2	4 M4 Lesson 29: Solve problems by using data from a line plot.
	Make a line plot to display a data set of measurements in fractions of a unit $(\frac{1}{2},\frac{1}{4},\frac{1}{8})$ . Solve problems involving addition and subtraction of fractions by using data displayed in line plots.	4 M4 Lesson 30: Represent data on a line plot.
	4.DA.3	Supplemental material is necessary to address circle graphs.
	Interpret data displayed in a circle graph.	