Grade 8 | Indiana Academic Standards for Mathematics
Correlation to *Eureka Math*²™

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*²™, 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*² 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*² 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 Math*² 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 Math*² 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*² 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.

Process Standards for Mathematics	Aligned Components of *Eureka Math²*
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.	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: 8 M2: Rigid Motions and Congruent Figures 8 M4: Linear Equations in One and Two Variables 8 M5: Systems of Linear Equations
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: 8 M1: Scientific Notation, Exponents, and Irrational Numbers 8 M4: Linear Equations in One and Two Variables 8 M5: Systems of Linear Equations 8 M6: Functions and Bivariate Statistics

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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.	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: 8 M1: Scientific Notation, Exponents, and Irrational Numbers 8 M2: Rigid Motions and Congruent Figures 8 M4: Linear Equations in One and Two Variables 8 M6: Functions and Bivariate Statistics

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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.	While lessons in every module engage students in modeling with mathematics, this mathematical practice is specifically addressed in the following modules: 8 M3: Dilations and Similar Figures 8 M4: Linear Equations in One and Two Variables
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: 8 M4: Linear Equations in One and Two Variables 8 M6: Functions and Bivariate Statistics

Process Standards for Mathematics	Aligned Components of *Eureka Math²*
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: 8 M1: Scientific Notation, Exponents, and Irrational Numbers 8 M2: Rigid Motions and Congruent Figures 8 M4: Linear Equations in One and Two Variables 8 M6: Functions and Bivariate Statistics
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: 8 M3: Dilations and Similar Figures 8 M5: Systems of Linear Equations 8 M6: Functions and Bivariate Statistics
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: 8 M1: Scientific Notation, Exponents, and Irrational Numbers 8 M2: Rigid Motions and Congruent Figures 8 M3: Dilations and Similar Figures 8 M4: Linear Equations in One and Two Variables

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Number Sense	**8.NS.1** Give examples of rational and irrational numbers and explain the difference between them. Understand that every number has a decimal equivalent. For rational numbers, show that the decimal equivalent terminates or repeats, and convert a repeating decimal into a rational number.	7 M2 Lesson 19: Rational Numbers as Decimals, Part 1 7 M2 Lesson 20: Rational Numbers as Decimals, Part 2 7 M2 Lesson 21: Comparing and Ordering Rational Numbers 8 M1 Lesson 22: Familiar and Not So Familiar Numbers 8 M4 Lesson 5: An Interesting Application of Linear Equations, Part 1 8 M4 Lesson 6: An Interesting Application of Linear Equations, Part 2
	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.	8 M1 Lesson 21: Approximating Values of Roots and π^2 8 M1 Lesson 23: Ordering Irrational Numbers
	8.NS.3 Given a numeric expression with common rational number bases and integer exponents, apply the properties of exponents to generate equivalent expressions.	8 M1 Topic B: Properties and Definitions of Exponents
	8.NS.4 Use square root symbols to represent solutions to equations of the form $x^2 = p$, where p is a positive rational number.	8 M1 Lesson 17: Solving Equations with Squares and Cubes 8 M1 Lesson 24: Revisiting Equations with Squares and Cubes

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Computation	**8.C.1** Solve real-world problems with rational numbers by using multiple operations.	7 M2 Lesson 25: Writing and Evaluating Expressions with Rational Numbers, Part 1 7 M2 Lesson 26: Writing and Evaluating Expressions with Rational Numbers, Part 2
	8.C.2 Solve real-world and other mathematical problems involving numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Interpret scientific notation that has been generated by technology, such as a scientific calculator, graphing calculator, or excel spreadsheet.	8 M1 Topic A: Introduction to Scientific Notation 8 M1 Lesson 7: Making Sense of the Exponent of 0 8 M1 Topic C: Applications of the Properties and Definitions of Exponents
Algebra and Functions	**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.	7 M3 Topic D: Inequalities 8 M4 Topic A: Linear Equations in One Variable 8 M4 Topic B: The Structure of Linear Equations in One Variable
	8.AF.2 Generate linear equations in one variable with one solution, infinitely many solutions, or no solutions. Justify the classification given.	8 M4 Lesson 3: Solving Linear Equations with Rational Coefficients 8 M4 Lesson 4: Using Linear Equations to Solve Problems 8 M4 Topic B: The Structure of Linear Equations in One Variable

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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).	8 M6 Topic A: 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.	8 M6 Lesson 9: Increasing and Decreasing Functions 8 M6 Lesson 10: Graphs of Nonlinear Functions Algebra I M3 Lesson 8: Identifying Key Features of a Function and Its Graph
	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.	8 M4 Topic E: Different Forms of Linear Equations 8 M6 Lesson 3: Linear Functions and Proportionality 8 M6 Lesson 6: Linear Functions and Rate of Change 8 M6 Lesson 10: Graphs of Nonlinear Functions *Supplemental material is necessary to address similarities and differences between linear and nonlinear functions.*
	8.AF.6 Construct a function to model a linear relationship between two quantities given a verbal description, table of values, or graph. Recognize in $y = mx + b$ that m is the slope (rate of change) and b is the y-intercept of the graph, and describe the meaning of each in the context of a problem.	8 M6 Lesson 6: Linear Functions and Rate of Change 8 M6 Lesson 7: Interpreting Rate of Change and Initial Value 8 M6 Lesson 25: Applications of Volume

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	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).	8 M6 Lesson 7: Interpreting Rate of Change and Initial Value 8 M6 Lesson 8: Comparing Functions
	8.AF.8 Understand that solutions to a system of two linear equations correspond to points of intersection of their graphs because points of intersection satisfy both equations simultaneously. Approximate the solution of a system of equations by graphing and interpreting the reasonableness of the approximation.	8 M5: Systems of Linear Equations
Geometry and Measurement	**8.GM.1** Identify, define, and describe attributes of three-dimensional geometric objects (right rectangular prisms, cylinders, cones, spheres, and pyramids). Explore the effects of slicing these objects using appropriate technology and describe the two-dimensional figure that results.	6 M5 Lesson 9: Properties of Solids 7 M4 Lesson 22: Understanding Planes and Cross Sections 7 M4 Lesson 23: Cross Section Scavenger Hunt
	8.GM.2 Solve real-world and other mathematical problems involving volume of cones, spheres, and pyramids and surface area of spheres.	8 M6 Topic E: Volume *Supplemental material is necessary to address the surface area of spheres.*

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	8.GM.3 Verify experimentally the properties of rotations, reflections, and translations, including: lines are mapped to lines, and line segments to line segments of the same length; angles are mapped to angles of the same measure; and parallel lines are mapped to parallel lines.	8 M2 Topic A: Rigid Motions and Their Properties
	8.GM.4 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. Describe a sequence that exhibits the congruence between two given congruent figures.	8 M2 Topic B: Rigid Motions and Congruent Figures
	8.GM.5 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations. Describe a sequence that exhibits the similarity between two given similar figures.	8 M3 Topic C: Similar Figures
	8.GM.6 Explore dilations, translations, rotations, and reflections on two-dimensional figures in the coordinate plane.	8 M2 Topic A: Rigid Motions and Their Properties 8 M3: Dilations and Similar Figures
	8.GM.7 Use inductive reasoning to explain the Pythagorean relationship.	8 M2 Topic D: Congruent Figures and the Pythagorean Theorem

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	8.GM.8 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and other mathematical problems in two dimensions.	8 M1 Topic D: Perfect Squares, Perfect Cubes, and the Pythagorean Theorem 8 M2 Topic D: Congruent Figures and the Pythagorean Theorem 8 M3 Lesson 16: Similar Right Triangles
	8.GM.9 Apply the Pythagorean Theorem to find the distance between two points in a coordinate plane.	8 M2 Lesson 20: Distance in the Coordinate Plane 8 M2 Lesson 22: On the Right Path
Data Analysis, Statistics, and Probability	**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.	8 M6 Lesson 11: Scatter Plots 8 M6 Lesson 12: Patterns in Scatter Plots
	8.DSP.2 Know 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 describe the model fit by judging the closeness of the data points to the line.	8 M6 Topic C: Bivariate Numerical Data
	8.DSP.3 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.	8 M6 Topic C: Bivariate Numerical Data *Supplemental material is necessary to address extrapolation.*

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	8.DSP.4 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. Understand and use appropriate terminology to describe independent, dependent, complementary, and mutually exclusive events.	7 M6 Lesson 5: Multistage Experiments 7 M6 Lesson 6: Outcomes That Are Not Equally Likely *Supplemental material is necessary to address appropriate terminology.*
	8.DSP.5 Represent sample spaces and find probabilities of compound events (independent and dependent) using organized lists, tables, and tree diagrams.	7 M6 Lesson 5: Multistage Experiments
	8.DSP.6 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 the multiplication counting principle.*