Grade 8 | Kentucky Mathematics Course Standards Correlation to *Eureka Math²®*

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 Math²®*, 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 Math²* 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 Math² 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 Math²* 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.

Standards for Mathematical Practice	Aligned Components of *Eureka Math²*
MP.1 Make sense of problems and persevere in solving them.	Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.
MP.2 Reason abstractly and quantitatively.	Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.
MP.3 Construct viable arguments and critique the reasoning of others.	Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.
MP.4 Model with mathematics.	Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.
MP.5 Use appropriate tools strategically.	Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.
MP.6 Attend to precision.	Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.
MP.7 Look for and make use of structure.	Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.
MP.8 Look for and express regularity in repeated reasoning.	Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.

The Number System

Know that there are numbers that are not rational and approximate them by rational numbers.

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.NS.1 Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational.	8 M4 Lesson 5: An Interesting Application of Linear Equations, Part 1 8 M4 Lesson 6: An Interesting Application of Linear Equations, Part 2
KY.8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram and estimate the value of expressions.	8 M1 Lesson 21: Approximating Values of Roots and π^2 8 M1 Lesson 23: Ordering Irrational Numbers

Expressions and Equations

Work with radicals and integer exponents.

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.	8 M1 Topic B: Properties and Definitions of Exponents

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.EE.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. Know that perfect squares and perfect cubes are rational.	8 M1 Lesson 16: Perfect Squares and Perfect Cubes 8 M1 Lesson 17: Solving Equations with Squares and Cubes 8 M1 Lesson 20: Square Roots 8 M1 Lesson 22: Familiar and Not So Familiar Numbers 8 M1 Lesson 24: Revisiting Equations with Squares and Cubes
KY.8.EE.3 Use numbers expressed in the form of a single digit times an integer power of 10 (Scientific Notation) to estimate very large or very small quantities and express how many times larger or smaller one is than the other.	8 M1 Lesson 1: Large and Small Positive Numbers 8 M1 Lesson 2: Comparing Large Numbers 8 M1 Lesson 3: Time to Be More Precise—Scientific Notation 8 M1 Lesson 7: Making Sense of the Exponent of 0 8 M1 Lesson 11: Small Positive Numbers in Scientific Notation
KY.8.EE.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.	8 M1 Lesson 2: Comparing Large Numbers 8 M1 Lesson 4: Adding and Subtracting Numbers Written in Scientific Notation 8 M1 Lesson 12: Operations with Numbers in Scientific Notation 8 M1 Lesson 13: Applications with Numbers in Scientific Notation 8 M1 Lesson 14: Choosing Units of Measurement 8 M1 Lesson 15: Get to the Point

Expressions and Equations

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

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	8 M4 Lesson 15: Comparing Proportional Relationships 8 M4 Lesson 16: Proportional Relationships and Slope
KY.8.EE.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 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.	8 M3 Lesson 17: Similar Triangles on a Line 8 M4 Lesson 16: Proportional Relationships and Slope 8 M4 Lesson 17: Slopes of Rising Lines 8 M4 Lesson 18: Slopes of Falling Lines 8 M4 Lesson 19: Using Coordinates to Find Slope 8 M4 Lesson 20: Slope-Intercept Form of the Equation of a Line

Expressions and Equations

Analyze and solve linear equations and pairs of simultaneous linear equations.

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.EE.7 Solve linear equations in one variable.	8 M4 Lesson 2: Solving Linear Equations 8 M4 Lesson 3: Solving Linear Equations with Rational Coefficients 8 M4 Lesson 4: Using Linear Equations to Solve Problems 8 M4 Lesson 10: Using Linear Equations to Solve Real-World Problems 8 M4 Lesson 11: Planning a Trip

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.EE.7.a 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).	8 M4 Lesson 7: Linear Equations with More Than One Solution 8 M4 Lesson 8: Another Possible Number of Solutions 8 M4 Lesson 9: Writing Linear Equations 8 M4 Lesson 10: Using Linear Equations to Solve Real-World Problems
KY.8.EE.7.b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms.	8 M4 Lesson 1: Equations 8 M4 Lesson 2: Solving Linear Equations 8 M4 Lesson 3: Solving Linear Equations with Rational Coefficients 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 M4 Lesson 7: Linear Equations with More Than One Solution 8 M4 Lesson 8: Another Possible Number of Solutions 8 M4 Lesson 10: Using Linear Equations to Solve Real-World Problems 8 M4 Lesson 11: Planning a Trip
KY.8.EE.8 Analyze and solve a system of two linear equations.	*This standard is fully addressed by the lessons aligned to its subsections.*

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.EE.8.a 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; understand that a system of two linear equations may have one solution, no solution, or infinitely many solutions.	8 M5 Topic A: Solving Systems of Linear Equations Graphically 8 M5 Lesson 7: The Substitution Method 8 M5 Lesson 10: Choosing a Solution Method 8 M5 Lesson 14: Back to the Coordinate Plane
KY.8.EE.8.b Solve systems of two linear equations in two variables algebraically by using substitution where at least one equation contains at least one variable whose coefficient is 1 and by inspection for simple cases.	8 M5 Lesson 1: Solving Problems with Equations and Their Graphs 8 M5 Lesson 3: Identifying Solutions 8 M5 Lesson 4: More Than One Solution 8 M5 Lesson 5: Estimating Solutions 8 M5 Topic B: Solving Systems of Equations Algebraically 8 M5 Topic C: Writing and Solving Systems of Linear Equations
KY.8.EE.8.c Solve real-world and mathematical problems leading to two linear equations in two variables.	8 M5 Lesson 1: Solving Problems with Equations and Their Graphs 8 M5 Topic C: Writing and Solving Systems of Linear Equations

Functions

Define, evaluate, and compare functions.

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.F.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.	8 M6 Lesson 1: Motion and Speed 8 M6 Lesson 2: Definition of a Function 8 M6 Lesson 4: More Examples of Functions 8 M6 Lesson 5: Graphs of Functions and Equations
KY.8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	8 M6 Lesson 7: Interpreting Rate of Change and Initial Value 8 M6 Lesson 8: Comparing Functions
KY.8.F.3 Understand properties of linear functions.	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
KY.8.F.3.a Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line.	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
KY.8.F.3.b Identify and give examples of functions that are not linear.	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

Functions

Use functions to model relationships between quantities.

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.F.4 Construct a function to model a linear relationship between two quantities.	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
KY.8.F.4.a 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.	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
KY.8.F.4.b 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.	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
KY.8.F.5 Use graphs to represent functions.	8 M6 Lesson 9: Increasing and Decreasing Functions 8 M6 Lesson 10: Graphs of Nonlinear Functions
KY.8.F.5.a Describe qualitatively the functional relationship between two quantities by analyzing a graph.	8 M6 Lesson 9: Increasing and Decreasing Functions 8 M6 Lesson 10: Graphs of Nonlinear Functions

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.F.5.b Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	8 M6 Lesson 9: Increasing and Decreasing Functions 8 M6 Lesson 10: Graphs of Nonlinear Functions

Geometry

Understand congruence and similarity using physical models, transparencies, or geometry software.

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.G.1 Verify experimentally the properties of rotations, reflections and translations: • Lines are congruent to lines. • Line segments are congruent to line segments of the same length. • Angles are congruent to angles of the same measure. • Parallel lines are congruent to parallel lines.	8 M2 Lesson 1: Motions of the Plane 8 M2 Lesson 2: Translations 8 M2 Lesson 3: Reflections 8 M2 Lesson 5: Rotations 8 M2 Lesson 7: Working Backward 8 M2 Lesson 8: Sequencing the Rigid Motions

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.G.2 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. Given two congruent figures, describe a sequence that exhibits the congruence between them.	8 M2 Topic B: Rigid Motions and Congruent Figures 8 M2 Lesson 12: Lines Cut by a Transversal
KY.8.G.3 Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates.	8 M2 Lesson 4: Translations and Reflections on the Coordinate Plane 8 M2 Lesson 6: Rotations on the Coordinate Plane 8 M2 Lesson 9: Ordering Sequences of Rigid Motions 8 M3 Topic A: Dilations 8 M3 Topic B: Properties of Dilations 8 M3 Lesson 9: Describing Dilations 8 M3 Lesson 10: Sequencing Transformations 8 M3 Lesson 16: Similar Right Triangles
KY.8.G.4 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. Given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	8 M3 Lesson 11: Similar Figures 8 M3 Lesson 12: Exploring Angles in Similar Triangles 8 M3 Lesson 13: Similar Triangles 8 M3 Lesson 17: Similar Triangles on a Line

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.G.5 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.	8 M2 Topic C: Angle Relationships 8 M3 Lesson 12: Exploring Angles in Similar Triangles 8 M3 Lesson 13: Similar Triangles 8 M3 Lesson 14: Using Similar Figures to Find Unknown Side Lengths 8 M3 Lesson 15: Applications of Similar Figures 8 M3 Lesson 16: Similar Right Triangles

Geometry

Understand and apply the Pythagorean Theorem.

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.G.6 Explain a proof of the Pythagorean Theorem and its converse.	8 M2 Lesson 17: Proving the Pythagorean Theorem 8 M2 Lesson 18: Proving the Converse of the Pythagorean Theorem 8 M2 Lesson 19: Using the Pythagorean Theorem and Its Converse
KY.8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	8 M1 Lesson 18: The Pythagorean Theorem 8 M1 Lesson 19: Using the Pythagorean Theorem 8 M1 Lesson 20: Square Roots 8 M2 Lesson 19: Using the Pythagorean Theorem and Its Converse 8 M2 Lesson 21: Applying the Pythagorean Theorem 8 M2 Lesson 22: On the Right Path 8 M3 Lesson 16: Similar Right Triangles

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	8 M2 Lesson 20: Distance in the Coordinate Plane 8 M2 Lesson 22: On the Right Path

Geometry

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

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.G.9 Apply the formulas for the volumes and surface areas of cones, cylinders and spheres and use them to solve real-world and mathematical problems.	7 M4 Lesson 19: Surface Area of Cylinders 8 M6 Topic E: Volume *Supplemental material is necessary to address surface area of cones and spheres.*

Statistics and Probability

Investigate patterns of association in bivariate data.

Kentucky Mathematics Course Standards	Aligned Components of *Eureka Math²*
KY.8.SP.1 Construct and interpret scatter plots for bivariate numerical data to investigate patterns of association between two quantities. 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
KY.8.SP.2 Know that lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a line and informally assess the model fit by judging the closeness of the data points to the line.	8 M6 Lesson 13: Informally Fitting a Line to Data 8 M6 Lesson 15: Linear Models 8 M6 Lesson 16: Using the Investigative Process 8 M6 Lesson 17: Analyzing the Model
KY.8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate numerical data, interpreting the slope and intercept.	8 M6 Lesson 6: Linear Functions and Rate of Change 8 M6 Lesson 7: Interpreting Rate of Change and Initial Value 8 M6 Lesson 14: Determining an Equation of a Line Fit to Data 8 M6 Lesson 15: Linear Models 8 M6 Lesson 16: Using the Investigative Process 8 M6 Lesson 17: Analyzing the Model