# Grade 8 | Alabama Standards for Mathematical Content 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.

| Student Mathematical Practices | Aligned Components of *Eureka Math²* |
|---|---|
| **MP.1**<br>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**<br>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**<br>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**<br>Model with mathematics. | Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson. |
| **MP.5**<br>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**<br>Attend to precision. | Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson. |
| **MP.7**<br>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**<br>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. |

## Number Systems and Operations

**Understand that the real number system is composed of rational and irrational numbers.**

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.NSO.1**<br>Define the real number system as composed of rational and irrational numbers. | *This standard is fully addressed by the lessons aligned to its subsections.* |
| **8.NSO.1.a**<br>Explain that every number has a decimal expansion; for rational numbers, the decimal expansion repeats or terminates. | 8 M4 Lesson 5: An Interesting Application of Linear Equations, Part 1<br>8 M4 Lesson 6: An Interesting Application of Linear Equations, Part 2 |
| **8.NSO.1.b**<br>Convert a decimal expansion that repeats into a rational number. | 8 M4 Lesson 5: An Interesting Application of Linear Equations, Part 1<br>8 M4 Lesson 6: An Interesting Application of Linear Equations, Part 2 |
| **8.NSO.2**<br>Locate rational approximations of irrational numbers on a number line, compare their sizes, and estimate the values of the irrational numbers. | 8 M1 Lesson 21: Approximating Values of Roots and $\pi^2$<br>8 M1 Lesson 23: Ordering Irrational Numbers |

## Algebra and Functions

**Apply concepts of integer exponents and radicals.**

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.AF.3**<br>Develop and apply properties of integer exponents to generate equivalent numerical and algebraic expressions. | 8 M1 Topic B: Properties and Definitions of Exponents |
| **8.AF.4**<br>Use square root and cube root symbols to represent solutions to equations. | *This standard is fully addressed by the lessons aligned to its subsections.* |
| **8.AF.4.a**<br>Evaluate square roots of perfect squares (less than or equal to 225) and cube roots of perfect cubes (less than or equal to 1,000). | 8 M1 Lesson 16: Perfect Squares and Perfect Cubes<br>8 M1 Lesson 17: Solving Equations with Squares and Cubes<br>8 M1 Lesson 20: Square Roots<br>8 M1 Lesson 22: Familiar and Not So Familiar Numbers<br>8 M1 Lesson 24: Revisiting Equations with Squares and Cubes |
| **8.AF.4.b**<br>Explain that the square root of a non-perfect square is irrational. | 8 M1 Lesson 16: Perfect Squares and Perfect Cubes<br>8 M1 Lesson 17: Solving Equations with Squares and Cubes<br>8 M1 Lesson 20: Square Roots<br>8 M1 Lesson 22: Familiar and Not So Familiar Numbers<br>8 M1 Lesson 24: Revisiting Equations with Squares and Cubes |

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.AF.5**<br>Estimate and compare very large or very small numbers in scientific notation. | 8 M1 Lesson 1: Large and Small Positive Numbers<br>8 M1 Lesson 2: Comparing Large Numbers<br>8 M1 Lesson 3: Time to Be More Precise—Scientific Notation<br>8 M1 Lesson 7: Making Sense of the Exponent of $0$<br>8 M1 Lesson 11: Small Positive Numbers in Scientific Notation |
| **8.AF.6**<br>Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. | *This standard is fully addressed by the lessons aligned to its subsections.* |
| **8.AF.6.a**<br>Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. | 8 M1 Lesson 2: Comparing Large Numbers<br>8 M1 Lesson 4: Adding and Subtracting Numbers Written in Scientific Notation<br>8 M1 Lesson 12: Operations with Numbers in Scientific Notation<br>8 M1 Lesson 13: Applications with Numbers in Scientific Notation<br>8 M1 Lesson 14: Choosing Units of Measurement<br>8 M1 Lesson 15: Get to the Point |
| **8.AF.6.b**<br>Interpret scientific notation that has been generated by technology. | 8 M1 Lesson 2: Comparing Large Numbers<br>8 M1 Lesson 4: Adding and Subtracting Numbers Written in Scientific Notation<br>8 M1 Lesson 12: Operations with Numbers in Scientific Notation<br>8 M1 Lesson 13: Applications with Numbers in Scientific Notation<br>8 M1 Lesson 14: Choosing Units of Measurement<br>8 M1 Lesson 15: Get to the Point |

## Algebra and Functions

**Analyze the relationship between proportional and non-proportional situations.**

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.AF.7**<br>Determine whether a relationship between two variables is proportional or non-proportional. | 7 M1 Topic A: Understanding Proportional Relationships<br>7 M1 Lesson 14: Extreme Bicycles |
| **8.AF.8**<br>Graph proportional relationships. | *This standard is fully addressed by the lessons aligned to its subsection.* |
| **8.AF.8.a**<br>Interpret the unit rate of a proportional relationship, describing the constant of proportionality as the slope of the graph which goes through the origin and has the equation $y = mx$ where $m$ is the slope. | 8 M4 Lesson 15: Comparing Proportional Relationships<br>8 M4 Lesson 16: Proportional Relationships and Slope |
| **8.AF.9**<br>Interpret $y = mx + b$ as defining a linear equation whose graph is a line with $m$ as the slope and $b$ as the $y$-intercept. | *This standard is fully addressed by the lessons aligned to its subsections.* |
| **8.AF.9.a**<br>Use similar triangles to explain why the slope $m$ is the same between any two distinct points on a non-vertical line in a coordinate plane. | 8 M3 Lesson 17: Similar Triangles on a Line<br>8 M4 Lesson 16: Proportional Relationships and Slope<br>8 M4 Lesson 17: Slopes of Rising Lines<br>8 M4 Lesson 18: Slopes of Falling Lines<br>8 M4 Lesson 19: Using Coordinates to Find Slope<br>8 M4 Lesson 20: Slope-Intercept Form of the Equation of a Line |

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.AF.9.b**<br>Given two distinct points in a coordinate plane, find the slope of the line containing the two points and explain why it will be the same for any two distinct points on the line. | 8 M4 Lesson 19: Using Coordinates to Find Slope |
| **8.AF.9.c**<br>Graph linear relationships, interpreting the slope as the rate of change of the graph and the $y$-intercept as the initial value. | 8 M6 Lesson 6: Linear Functions and Rate of Change<br>8 M6 Lesson 7: Interpreting Rate of Change and Initial Value<br>8 M6 Lesson 25: Applications of Volume |
| **8.AF.9.d**<br>Given that the slopes for two different sets of points are equal, demonstrate that the linear equations that include those two sets of points may have different $y$-intercepts. | 8 M4 Lesson 21: Slope and Parallel Lines |

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.AF.10**<br>Compare proportional and non-proportional linear relationships represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions) to solve real-world problems. | *Supplemental material is necessary to address this standard.* |

## Algebra and Functions

**Analyze and solve linear equations and systems of two linear equations.**

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.AF.11**<br>Solve multi-step linear equations in one variable, including rational number coefficients, and equations that require using the distributive property and combining like terms. | 8 M4 Topic A: Linear Equations in One Variable<br>8 M4 Lesson 7: Linear Equations with More Than One Solution<br>8 M4 Lesson 8: Another Possible Number of Solutions<br>8 M4 Lesson 10: Using Linear Equations to Solve Real-World Problems<br>8 M4 Lesson 11: Planning a Trip |
| **8.AF.11.a**<br>Determine whether linear equations in one variable have one solution, no solution, or infinitely many solutions of the form $x = a$, $a = a$, or $a = b$ (where $a$ and $b$ are different numbers). | 8 M4 Lesson 7: Linear Equations with More Than One Solution<br>8 M4 Lesson 8: Another Possible Number of Solutions<br>8 M4 Lesson 9: Writing Linear Equations<br>8 M4 Lesson 10: Using Linear Equations to Solve Real-World Problems |

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.AF.11.b**<br>Represent and solve real-world and mathematical problems with equations and interpret each solution in the context of the problem. | 8 M4 Lesson 10: Using Linear Equations to Solve Real-World Problems<br>8 M4 Lesson 11: Planning a Trip |
| **8.AF.12**<br>Solve systems of two linear equations in two variables by graphing and substitution. | 8 M5 Lesson 1: Solving Problems with Equations and Their Graphs<br>8 M5 Lesson 3: Identifying Solutions<br>8 M5 Lesson 4: More Than One Solution<br>8 M5 Lesson 5: Estimating Solutions<br>8 M5 Topic B: Solving Systems of Equations Algebraically<br>8 M5 Topic C: Writing and Solving Systems of Linear Equations |
| **8.AF.12.a**<br>Explain that the solution(s) of systems of two linear equations in two variables corresponds to points of intersection on their graphs because points of intersection satisfy both equations simultaneously. | 8 M5 Topic A: Solving Systems of Linear Equations Graphically<br>8 M5 Lesson 7: The Substitution Method<br>8 M5 Lesson 10: Choosing a Solution Method<br>8 M5 Lesson 14: Back to the Coordinate Plane |
| **8.AF.12.b**<br>Interpret and justify the results of systems of two linear equations in two variables (one solution, no solution, or infinitely many solutions) when applied to real-world and mathematical problems. | 8 M5 Lesson 1: Solving Problems with Equations and Their Graphs<br>8 M5 Topic C: Writing and Solving Systems of Linear Equations |

## Algebra and Functions

**Explain, evaluate, and compare functions.**

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.AF.13**<br>Determine whether a relation is a function, defining a function as a rule that assigns to each input (independent value) exactly one output (dependent value), and given a graph, table, mapping, or set of ordered pairs. | 8 M6 Lesson 1: Motion and Speed<br>8 M6 Lesson 2: Definition of a Function<br>8 M6 Lesson 4: More Examples of Functions<br>8 M6 Lesson 5: Graphs of Functions and Equations |
| **8.AF.14**<br>Evaluate functions defined by a rule or an equation, given values for the independent variable. | 8 M6 Lesson 2: Definition of a Function<br>8 M6 Lesson 3: Linear Functions and Proportionality<br>8 M6 Lesson 5: Graphs of Functions and Equations |
| **8.AF.15**<br>Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions. | 8 M6 Lesson 7: Interpreting Rate of Change and Initial Value<br>8 M6 Lesson 8: Comparing Functions |
| **8.AF.15.a**<br>Distinguish between linear and non-linear functions. | 8 M6 Lesson 3: Linear Functions and Proportionality<br>8 M6 Lesson 6: Linear Functions and Rate of Change<br>8 M6 Lesson 10: Graphs of Nonlinear Functions |

## Algebra and Functions

**Use functions to model relationships between quantities.**

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.AF.16**<br>Construct a function to model a linear relationship between two variables. | *This standard is fully addressed by the lessons aligned to its subsection.* |
| **8.AF.16.a**<br>Interpret the rate of change (slope) and initial value of the linear function from a description of a relationship or from two points in a table or graph. | 8 M6 Lesson 6: Linear Functions and Rate of Change<br>8 M6 Lesson 7: Interpreting Rate of Change and Initial Value<br>8 M6 Lesson 25: Applications of Volume |
| **8.AF.17**<br>Analyze the relationship (increasing or decreasing, linear or non-linear) between two quantities represented in a graph. | 8 M6 Lesson 9: Increasing and Decreasing Functions<br>8 M6 Lesson 10: Graphs of Nonlinear Functions |

## Data Analysis, Statistics, and Probability

**Investigate patterns of association in bivariate data.**

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.DSP.18**<br>Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities, describing patterns in terms of positive, negative, or no association, linear and non-linear association, clustering, and outliers. | 8 M6 Lesson 11: Scatter Plots<br>8 M6 Lesson 12: Patterns in Scatter Plots |
| **8.DSP.19**<br>Given a scatter plot that suggests a linear association, informally draw a line to fit the data, and 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<br>8 M6 Lesson 15: Linear Models<br>8 M6 Lesson 16: Using the Investigative Process<br>8 M6 Lesson 17: Analyzing the Model |
| **8.DSP.20**<br>Use a linear model of a real-world situation to solve problems and make predictions. | *This standard is fully addressed by the lessons aligned to its subsection.* |
| **8.DSP.20.a**<br>Describe the rate of change and $y$-intercept in the context of a problem using a linear model of a real-world situation. | 8 M6 Lesson 6: Linear Functions and Rate of Change<br>8 M6 Lesson 7: Interpreting Rate of Change and Initial Value<br>8 M6 Lesson 14: Determining an Equation of a Line Fit to Data<br>8 M6 Lesson 15: Linear Models<br>8 M6 Lesson 16: Using the Investigative Process<br>8 M6 Lesson 17: Analyzing the Model |

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.DSP.21**<br>Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects, using relative frequencies calculated for rows or columns to describe possible associations between the two variables. | 8 M6 Topic D: Bivariate Categorical Data |

## Geometry and Measurement

**Understand congruence and similarity using physical models or technology.**

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.GM.22**<br>Verify experimentally the properties of rigid motions (rotations, reflections, and translations): lines are taken to lines, and line segments are taken to line segments of the same length; angles are taken to angles of the same measure; and parallel lines are taken to parallel lines. | 8 M2 Lesson 1: Motions of the Plane<br>8 M2 Lesson 2: Translations<br>8 M2 Lesson 3: Reflections<br>8 M2 Lesson 5: Rotations<br>8 M2 Lesson 7: Working Backward<br>8 M2 Lesson 8: Sequencing the Rigid Motions |

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.GM.22.a**<br>Given a pair of two-dimensional figures, determine if a series of rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are congruent; describe the transformation sequence that verifies a congruence relationship. | 8 M2 Topic B: Rigid Motions and Congruent Figures<br>8 M2 Lesson 12: Lines Cut by a Transversal |
| **8.GM.23**<br>Use coordinates to describe the effect of transformations (dilations, translations, rotations, and reflections) on two-dimensional figures. | 8 M2 Lesson 4: Translations and Reflections on the Coordinate Plane<br>8 M2 Lesson 6: Rotations on the Coordinate Plane<br>8 M2 Lesson 9: Ordering Sequences of Rigid Motions<br>8 M3 Topic A: Dilations<br>8 M3 Topic B: Properties of Dilations<br>8 M3 Lesson 9: Describing Dilations<br>8 M3 Lesson 10: Sequencing Transformations<br>8 M3 Lesson 16: Similar Right Triangles |
| **8.GM.24**<br>Given a pair of two-dimensional figures, determine if a series of dilations and rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are similar; describe the transformation sequence that exhibits the similarity between them. | 8 M3 Lesson 11: Similar Figures<br>8 M3 Lesson 12: Exploring Angles in Similar Triangles<br>8 M3 Lesson 13: Similar Triangles<br>8 M3 Lesson 17: Similar Triangles on a Line |

## Geometry and Measurement

**Analyze parallel lines cut by a transversal.**

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.GM.25**<br>Analyze and apply properties of parallel lines cut by a transversal to determine missing angle measures. | *This standard is fully addressed by the lessons aligned to its subsection.* |
| **8.GM.25.a**<br>Use informal arguments to establish that the sum of the interior angles of a triangle is 180 degrees. | 8 M2 Topic C: Angle Relationships<br>8 M3 Lesson 12: Exploring Angles in Similar Triangles<br>8 M3 Lesson 13: Similar Triangles<br>8 M3 Lesson 14: Using Similar Figures to Find Unknown Side Lengths<br>8 M3 Lesson 15: Applications of Similar Figures<br>8 M3 Lesson 16: Similar Right Triangles |

## Geometry and Measurement

**Understand and apply the Pythagorean Theorem.**

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.GM.26**<br>Informally justify the Pythagorean Theorem and its converse. | 8 M2 Lesson 17: Proving the Pythagorean Theorem<br>8 M2 Lesson 18: Proving the Converse of the Pythagorean Theorem<br>8 M2 Lesson 19: Using the Pythagorean Theorem and Its Converse |
| **8.GM.27**<br>Apply the Pythagorean Theorem to find the distance between two points in a coordinate plane. | 8 M2 Lesson 20: Distance in the Coordinate Plane<br>8 M2 Lesson 22: On the Right Path |

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.GM.28**<br>Apply the Pythagorean Theorem to determine unknown side lengths of right triangles, including real-world applications. | 8 M1 Lesson 18: The Pythagorean Theorem<br>8 M1 Lesson 19: Using the Pythagorean Theorem<br>8 M1 Lesson 20: Square Roots<br>8 M2 Lesson 19: Using the Pythagorean Theorem and Its Converse<br>8 M2 Lesson 21: Applying the Pythagorean Theorem<br>8 M2 Lesson 22: On the Right Path<br>8 M3 Lesson 16: Similar Right Triangles |

## Geometry and Measurement

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

| Alabama Standards for Mathematical Content | Aligned Components of *Eureka Math²* |
|---|---|
| **8.GM.29**<br>Informally derive the formulas for the volume of cones and spheres by experimentally comparing the volumes of cones and spheres with the same radius and height to a cylinder with the same dimensions. | 8 M6 Lesson 23: Volume of Cones<br>8 M6 Lesson 24: Volume of Spheres |
| **8.GM.30**<br>Use formulas to calculate the volumes of three-dimensional figures (cylinders, cones, and spheres) to solve real-world problems. | 8 M6 Topic E: Volume |