

ABOUT EUREKA MATH

Created by the nonprofit Great Minds, *Eureka Math* helps teachers deliver unparalleled math instruction that provides students with a deep understanding and fluency in math. Crafted by teachers and math scholars, the curriculum carefully sequences the mathematical progressions to maximize coherence from Prekindergarten through Precalculus—a principle tested and proven to be essential in students’ mastery of math.

Teachers and students using *Eureka Math* find the trademark “Aha!” moments in *Eureka Math* to be a source of joy and inspiration, lesson after lesson, year after year.

ALIGNED

Eureka Math is the only curriculum found by EdReports.org to align fully with the Common Core State Standards for Mathematics for all grades, Kindergarten through Grade 8. Great Minds offers detailed analyses which demonstrate how each grade of *Eureka Math* aligns with specific state standards. Access these free alignment studies at greatminds.org/state-studies.

DATA

Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

FULL SUITE OF RESOURCES

As a nonprofit, Great Minds offers the *Eureka Math* curriculum as PDF downloads for free, noncommercial use. Access the free PDFs at greatminds.org/math/curriculum.

The teacher–writers who created the curriculum have also developed essential resources, available only from Great Minds, including the following:





- Printed material in English and Spanish
- Digital resources
- Professional development
- Classroom tools and manipulatives
- Teacher support materials
- Parent resources

Kansas Mathematics Standards Correlation to *Eureka Math*™

GRADE 8 MATHEMATICS

The majority of the Grade 8 Kansas Mathematics Standards are fully covered by the Grade 8 *Eureka Math* curriculum. The areas where the Grade 8 Kansas Mathematics Standards and Grade 8 *Eureka Math* do not align will require the use of *Eureka Math* content from other grade levels or supplemental materials. A detailed analysis of alignment is provided in the table below. With strategic placement of supplemental materials, *Eureka Math* can ensure students are successful in achieving the proficiencies of the Kansas Mathematics Standards while still benefiting from the coherence and rigor of *Eureka Math*.

INDICATORS

-  Green indicates that the Kansas standard is fully addressed in *Eureka Math*.
-  Yellow indicates that the Kansas standard may not be completely addressed in *Eureka Math*.
-  Red indicates that the Kansas standard is not addressed in *Eureka Math*.
-  Blue indicates there is a discrepancy between the grade level at which this standard is addressed in the Kansas standards and in *Eureka Math*.

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

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. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

Lessons in every module engage students in making sense of problems and persevering in solving them as required by this standard. This practice standard is analogous to the CCSSM Standards for Mathematical Practice 1, which is specifically addressed in the following modules:

G8 M1: Integer Exponents and Scientific Notation

G8 M4: Linear Equations

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

2: Reason abstractly and quantitatively.

Mathematically proficient students make sense of the quantities and their relationships in problem situations. Students 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.

Lessons in every module engage students in reasoning abstractly and quantitatively as required by this standard. This practice standard is analogous to the CCSSM Standards for Mathematical Practice 2, which is specifically addressed in the following modules:

G8 M1: Integer Exponents and Scientific Notation

G8 M2: The Concept of Congruence

G8 M4: Linear Equations

G8 M5: Examples of Functions from Geometry

G8 M6: Linear Functions

Standards for Mathematical Practice

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 are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, 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. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen 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*

Lessons in every module engage students in constructing viable arguments and critiquing the reasoning of others as required by this standard. This practice standard is analogous to the CCSSM Standards for Mathematical Practice 3, which is specifically addressed in the following modules:

G8 M1: Integer Exponents and Scientific Notation

G8 M2: The Concept of Congruence

G8 M3: Similarity

G8 M4: Linear Equations

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

4: Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know 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 can 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.

Lessons in every module engage students in modeling with mathematics as required by this standard. This practice standard is analogous to the CCSSM Standards for Mathematical Practice 4, which is specifically addressed in the following modules:

G8 M3: Similarity

G8 M4: Linear Equations

G8 M6: Linear Functions

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

5: Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. 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. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

Lessons in every module engage students in using appropriate tools strategically as required by this standard. This practice standard is analogous to the CCSSM Standards for Mathematical Practice 5, which is specifically addressed in the following modules:

G8 M3: Similarity

G8 M4: Linear Equations

G8 M6: Linear Functions

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

6: Attend to precision.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions 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 are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

Lessons in every module engage students in attending to precision as required by this standard. This practice standard is analogous to the CCSSM Standards for Mathematical Practice 6, which is specifically addressed in the following modules:

G8 M1: Integer Exponents and Scientific Notation

G8 M2: The Concept of Congruence

G8 M3: Similarity

G8 M4: Linear Equations

G8 M5: Examples of Functions from Geometry

G8 M6: Linear Functions

G8 M7: Introduction to Irrational Numbers Using Geometry

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

7: Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y .

Lessons in every module engage students in looking for and making use of structure as required by this standard. This practice standard is analogous to the CCSSM Standards for Mathematical Practice 7, which is specifically addressed in the following modules:

G8 M1: Integer Exponents and Scientific Notation

G8 M4: Linear Equations

G8 M6: Linear Functions

G8 M7: Introduction to Irrational Numbers Using Geometry

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

8: Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

Lessons in every module engage students in looking for and expressing regularity in repeated reasoning as required by this standard. This practice standard is analogous to the CCSSM Standards for Mathematical Practice 8, which is specifically addressed in the following modules:

G8 M1: Integer Exponents and Scientific Notation

G8 M3: Similarity

G8 M5: Examples of Functions from Geometry

G8 M7: Introduction to Irrational Numbers Using Geometry

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
The Number System	Cluster: Know that there are numbers that are not rational, and approximate them by rational numbers.	
	8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	G8 M7 Topic B: Decimal Expansions of Numbers
	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.	G8 M7 Topic A: Square and Cube Roots G8 M7 Lesson 10: Converting Repeating Decimals to Fractions G8 M7 Lesson 11: The Decimal Expansion of Some Irrational Numbers G8 M7 Lesson 13: Comparing Irrational Numbers G8 M7 Lesson 14: Decimal Expansion of π

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
Expressions and Equations	Cluster: Work with radicals and integer exponents.	
	8.EE.1 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 whole number perfect squares with solutions between 0 and 15 and cube roots of whole number perfect cubes with solutions between 0 and 5. Know that $\sqrt{2}$ is irrational.	G8 M7 Lesson 2: Square Roots G8 M7 Lesson 5: Solving Equations with Radicals
	8.EE.2 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.	G8 M1 Lesson 7: Magnitude G8 M1 Lesson 8: Estimating Quantities

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
	<p>8.EE.3</p> <p>Read and write 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.</p>	<p>G8 M1: Integer Exponents and Scientific Notation</p>
	<p>Cluster: Understand the connections between proportional relationships, lines, and linear equations.</p>	
	<p>8.EE.4</p> <p>Graph proportional relationships, interpreting its unit rate as the slope (m) of the graph. Compare two different proportional relationships represented in different ways.</p>	<p>G8 M4 Topic B: Linear Equations in Two Variables and Their Graphs</p> <p>G8 M4 Lesson 15: The Slope of a Non-Vertical Line</p> <p>G8 M4 Lesson 22: Constant Rates Revisited</p> <p>G8 M4 Lesson 24: Introduction to Simultaneous Equations</p>

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
	<p>8.EE.5</p> <p>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 and extend to include the use of the slope formula ($m = (y_2 - y_1)/(x_2 - x_1)$) when given two coordinate points (x_1, y_1) and (x_2, y_2). Generate the equation $y = mx$ for a line through the origin (proportional) and the equation $y = mx + b$ for a line with slope m intercepting the vertical axis at y-intercept b (not proportional when $b \neq 0$).</p>	G8 M4 Topic C: Slope and Equations of Lines
	<p>8.EE.6</p> <p>Describe the relationship between the proportional relationship expressed in $y = mx$ and the non-proportional linear relationship $y = mx + b$ as a result of a vertical translation.</p>	G8 M4 Topic C: Slope and Equations of Lines

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
	<p>Cluster: Analyze and solve linear equations and inequalities.</p>	
	<p>8.EE.7 Fluently (efficiently, accurately, and flexibly) solve one-step, two-step, and multi-step linear equations and inequalities in one variable, including situations with the same variable appearing on both sides of the equal sign.</p>	
	<p>a. Give examples of linear equations in one variable with one solution ($x = a$), infinitely many solutions ($a = a$), or no solutions ($a = b$). 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).</p>	<p>G8 M4 Topic A: Writing and Solving Linear Equations</p>
	<p>b. Solve linear equations and inequalities with rational number coefficients, including equations/inequalities whose solutions require expanding and/or factoring expressions using the distributive property and collecting like terms.</p>	<p>G7 M3 Topic B: Solve Problems Using Expressions, Equations, and Inequalities G8 M4 Topic A: Writing and Solving Linear Equations</p>

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
Functions	Cluster: Define, evaluate, and compare functions.	
	<p>8.F.1 Explain 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.</p>	G8 M5: Examples of Functions from Geometry
	<p>8.F.2 Compare properties of two linear functions represented in a variety of ways (algebraically, graphically, numerically in tables, or by verbal descriptions).</p>	G8 M5 Lesson 7: Comparing Linear Functions and Graphs

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
	<p>8.F.3 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.</p>	G8 M5: Examples of Functions from Geometry
	Cluster: Use functions to model relationships between quantities.	
	<p>8.F.4 Construct a function to model a linear relationship between two quantities. 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. 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.</p>	G8 M6 Topic A: Linear Functions
	<p>8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.</p>	G8 M6 Topic A: Linear Functions

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
Geometry	Cluster: Geometric measurement: understand concepts of angle and measure angles.	
	8.G.1 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:	
	a. 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. An angle that turns through $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles.	G4 M4 Topic B: Angle Measurement
	b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.	G4 M4 Topic B: Angle Measurement
	8.G.2 Measure angles in whole-number degrees using a protractor. Draw angles of specified measure using a protractor and straight edge.	G4 M4 Topic B: Angle Measurement

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
	<p>8.G.3 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems.</p>	G4 M4 Topic C: Problem Solving with the Addition of Angle Measures
	<p>8.G.4 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and use them to solve simple equations for an unknown angle in a figure.</p>	G7 M3 Lessons 10–11: Angle Problems and Solving Equations G7 M6 Topic A: Unknown Angles
	<p>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.</p>	G8 M2 Topic C: Congruence and Angle Relationships G8 M3 Topic B: Similar Figures

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
	<p>8.G.6 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on drawing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</p>	G7 M6 Topic B: Constructing Triangles
	<p>Cluster: Understand and apply the Pythagorean Theorem.</p>	
	<p>8.G.7 Explain a proof of the Pythagorean Theorem and its converse.</p>	G8 M2 Topic D: The Pythagorean Theorem G8 M3 Topic C: The Pythagorean Theorem G8 M7 Topic C: The Pythagorean Theorem
	<p>8.G.8 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</p>	G8 M2 Topic D: The Pythagorean Theorem G8 M3 Topic C: The Pythagorean Theorem G8 M4 Topic E: Pythagorean Theorem G8 M7: Introduction to Irrational Numbers Using Geometry

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
	<p>8.G.9 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</p>	<p>G8 M2 Topic D: The Pythagorean Theorem G8 M7 Lesson 17: Distance on the Coordinate Plane</p>
	<p>Cluster: Solve real-world and mathematical problems involving measurement.</p>	
	<p>8.G.10 Use the formulas or informal reasoning to find the arc length, areas of sectors, surface areas and volumes of pyramids, cones, and spheres.</p>	<p>G8 M5: Examples of Functions from Geometry G8 M7 Topic D: Applications of Radicals and Roots</p>
	<p>8.G.11 Investigate the relationship between the formulas of three dimensional geometric shapes;</p>	
	<p>a. Generalize the volume formula for pyramids and cones ($V = \frac{1}{3} Bh$).</p>	<p>G8 M5 Lesson 10: Volumes of Familiar Shapes—Cones and Cylinders Note: Supplemental material is necessary to address pyramids.</p>
	<p>b. Generalize surface area formula of pyramids and cones ($SA = B + \frac{1}{2}Pl$).</p>	<p>G7 M3 Lessons 21–22: Surface Area G7 M3 Lessons 25–26: Volume and Surface Area G7 M6 Lessons 23–24: Surface Area Note: Supplemental material is necessary to address cones.</p>

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
	<p>8.G.12</p> <p>Solve real-world and mathematical problems involving arc length, area of two-dimensional shapes including sectors, volume and surface area of three-dimensional objects including pyramids, cones and spheres.</p>	<p>G7 M3 Lessons 21–22: Surface Area</p> <p>G7 M3 Lessons 25–26: Volume and Surface Area</p> <p>G7 M6 Lessons 23–24: Surface Area</p> <p>G8 M5: Examples of Functions from Geometry</p> <p>G8 M7: Introduction to Irrational Numbers Using Geometry</p> <p>Note: Supplemental material is necessary to completely address this standard.</p>
<p>Statistics and Probability</p>	<p>Cluster: Investigate patterns of association in bivariate data.</p>	
	<p>8.SP.1</p> <p>Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.</p>	<p>G8 M6: Linear Functions</p>
	<p>8.SP.2</p> <p>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 informally assess the model fit by judging the closeness of the data points to the line.</p>	<p>G8 M6: Linear Functions</p>

Domain	Standards for Mathematical Content	Aligned Components of <i>Eureka Math</i>
	<p>8.SP.3</p> <p>Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.</p>	<p>G8 M6 Topic C: Linear and Nonlinear Models</p>