# EUREKA MATH™

GREAT MINDS

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| **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

# Arizona Mathematics Standards Correlation to *Eureka Math*™

## GRADE 7 MATHEMATICS

The Grade 7 Arizona Mathematics Standards are fully covered by the Grade 7 *Eureka Math* curriculum. A detailed analysis of alignment is provided in the table below.

## INDICATORS

Green indicates that the Arizona standard is fully addressed in *Eureka Math*.

Yellow indicates that the Arizona standard may not be completely addressed in *Eureka Math*.

Red indicates that the Arizona 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 Arizona standards and in *Eureka Math*.

| Standards for Mathematical Practice | Aligned Components of *Eureka Math* |
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| **1: Make sense of problems and persevere in solving them.**<br><br>Mathematically proficient students explain to themselves the meaning of a problem, look for entry points to begin work on the problem, and plan and choose a solution pathway. While engaging in productive struggle to solve a problem, they continually ask themselves, "Does this make sense?" to monitor and evaluate their progress and change course if necessary. Once they have a solution, they look back at the problem to determine if the solution is reasonable and accurate. Mathematically proficient students check their solutions to problems using different methods, approaches, or representations. They also compare and understand different representations of problems and different solution pathways, both their own and those of others. | 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:<br><br>G7 M1: Ratios and Proportional Relationships<br><br>G7 M2: Rational Numbers<br><br>G7 M4: Percent and Proportional Relationships<br><br>G7 M6: Geometry |
| **2: Reason abstractly and quantitatively.**<br><br>Mathematically proficient students make sense of quantities and their relationships in problem situations. Students can contextualize and decontextualize problems involving quantitative relationships. They contextualize quantities, operations, and expressions by describing a corresponding situation. They decontextualize a situation by representing it symbolically. As they manipulate the symbols, they can pause as needed to access the meaning of the numbers, the units, and the operations that the symbols represent. Mathematically proficient students know and flexibly use different properties of operations, numbers, and geometric objects and when appropriate they interpret their solution in terms of the context. | 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:<br><br>G7 M1: Ratios and Proportional Relationships<br><br>G7 M2: Rational Numbers<br><br>G7 M3: Expressions and Equations<br><br>G7 M4: Percent and Proportional Relationships<br><br>G7 M5: Statistics and Probability |

| Standards for Mathematical Practice | Aligned Components of *Eureka Math* |
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| **3: Construct viable arguments and critique the reasoning of others.**<br><br>Mathematically proficient students construct mathematical arguments (explain the reasoning underlying a strategy, solution, or conjecture) using concrete, pictorial, or symbolic referents. Arguments may also rely on definitions, assumptions, previously established results, properties, or structures. Mathematically proficient students 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. Mathematically proficient students present their arguments in the form of representations, actions on those representations, and explanations in words (oral or written). Students critique others by affirming or questioning the reasoning of others. They can listen to or read the reasoning of others, decide whether it makes sense, ask questions to clarify or improve the reasoning, and validate or build on it. Mathematically proficient students can communicate their arguments, compare them to others, and reconsider their own arguments in response to the critiques of others. | 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:<br><br>G7 M5: Statistics and Probability<br><br>G7 M6: Geometry |

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| **4: Model with mathematics.**<br><br>Mathematically proficient students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. When given a problem in a contextual situation, they identify the mathematical elements of a situation and create a mathematical model that represents those mathematical elements and the relationships among them. Mathematically proficient students use their model to analyze the relationships and draw conclusions. They 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:<br><br>G7 M2: Rational Numbers<br><br>G7 M3: Expressions and Equations<br><br>G7 M5: Statistics and Probability |
| **5: Use appropriate tools strategically.**<br><br>Mathematically proficient students consider available tools when solving a mathematical problem. They choose tools that are relevant and useful to the problem at hand. 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. Students deepen their understanding of mathematical concepts when using tools to visualize, explore, compare, communicate, make and test predictions, and understand the thinking of others. | 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:<br><br>G7 M4: Percent and Proportional Relationships<br><br>G7 M5: Statistics and Probability<br><br>G7 M6: Geometry |

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| **6: Attend to precision.**<br><br>Mathematically proficient students clearly communicate to others using appropriate mathematical terminology, and craft explanations to convey their reasoning. When making mathematical arguments about a solution, strategy, or conjecture, they describe mathematical relationships and connect their words clearly to their representations. Mathematically proficient students understand meanings of symbols used in mathematics, calculate accurately and efficiently, label quantities appropriately, and record their work clearly and concisely. | 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:<br><br>G7 M2: Rational Numbers<br><br>G7 M3: Expressions and Equations<br><br>G7 M4: Percent and Proportional Relationships<br><br>G7 M5: Statistics and Probability |
| **7: Look for and make use of structure.**<br><br>Mathematically proficient students use structure and patterns to assist in making connections among mathematical ideas or concepts when making sense of mathematics. Students recognize and apply general mathematical rules to complex situations. They are able to compose and decompose mathematical ideas and notations into familiar relationships. Mathematically proficient students manage their own progress, stepping back for an overview and shifting perspective when needed. | 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:<br><br>G7 M2: Rational Numbers<br><br>G7 M3: Expressions and Equations<br><br>G7 M4: Percent and Proportional Relationships<br><br>G7 M6: Geometry |

| Standards for Mathematical Practice | Aligned Components of *Eureka Math* |
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| **8: Look for and express regularity in repeated reasoning.**<br><br>Mathematically proficient students look for and describe regularities as they solve multiple related problems. They formulate conjectures about what they notice and communicate observations with precision. While solving problems, students maintain oversight of the process and continually evaluate the reasonableness of their results. This informs and strengthens their understanding of the structure of mathematics which leads to fluency. | 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:<br><br>G7 M3: Expressions and Equations |

| Domain | Standards for Mathematical Content | Aligned Components of *Eureka Math* |
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| **Ratio and Proportion** | **Cluster: Analyze proportional relationships and use them to solve mathematical problems and problems in real-world context.** | |
| | **7.RP.A.1**<br><br>Compute unit rates associated with ratios involving both simple and complex fractions, including ratios of quantities measured in like or different units. | G7 M1 Topic C: Ratios and Rates Involving Fractions |
| | **7.RP.A.2**<br><br>Recognize and represent proportional relationships between quantities. | |
| | a. Decide whether two quantities are in a proportional relationship (e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin). | G7 M1 Topic A: Proportional Relationships |
| | b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. | G7 M1 Topic B: Unit Rate and the Constant of Proportionality<br><br>G7 M1 Lesson 15: Equations of Graphs of Proportional Relationships Involving Fractions<br><br>G7 M1 Lesson 16: Relating Scale Drawings to Ratios and Rates<br><br>G7 M4 Lesson 12: The Scale Factor as a Percent for a Scale Drawing |

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| | c.  Represent proportional relationships by equations. | G7 M1 Lesson 2: Proportional Relationships<br><br>G7 M1 Topic B: Unit Rate and the Constant of Proportionality<br><br>G7 M1 Lesson 14: Multi-Step Ratio Problems<br><br>G7 M4: Percent and Proportional Relationships |
| | d.  Explain what a point $(x, y)$ on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where $r$ is the unit rate. | G7 M1 Lesson 10: Interpreting Graphs of Proportional Relationships |
| | **7.RP.A.3**<br>Use proportional relationships to solve multi-step ratio and percent problems (e.g., simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error). | G7 M1 Lesson 13: Finding Equivalent Ratios Given the Total Quantity<br><br>G7 M4: Percent and Proportional Relationships |
| **The Number System** | **Cluster: Apply and extend previous understanding of operations with fractions to add, subtract, multiply, and divide rational numbers except division by zero.** | |
| | **7.NS.A.1**<br>Add and subtract integers and other rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. | |
| | a.  Describe situations in which opposite quantities combine to make 0. | G7 M2 Lesson 1: Opposite Quantities Combine to Make Zero |

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| | b. Understand *p* + *q* as the number located a distance \|*q*\| from *p*, in the positive or negative direction depending on whether *q* is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world context. | G7 M2 Topic A: Addition and Subtraction of Integers and Rational Numbers |
| | c. Understand subtraction of rational numbers as adding the additive inverse, *p* − *q* = *p* + (−*q*). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world context. | G7 M2 Topic A: Addition and Subtraction of Integers and Rational Numbers |
| | d. Apply properties of operations as strategies to add and subtract rational numbers. | G7 M2 Lessons 8–9: Applying the Properties of Operations to Add and Subtract Rational Numbers |

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| | **7.NS.A.2**<br>Multiply and divide integers and other rational numbers. | | |
| | a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. | | G7 M2 Lesson 10: Understanding Multiplication of Integers<br><br>G7 M2 Lesson 11: Develop Rules for Multiplying Signed Numbers<br><br>G7 M2 Lesson 15: Multiplication and Division of Rational Numbers |
| | b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If $p$ and $q$ are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. | | G7 M2 Lesson 12: Division of Integers<br><br>G7 M2 Lesson 15: Multiplication and Division of Rational Numbers |
| | c. Apply properties of operations as strategies to multiply and divide rational numbers. | | G7 M2 Lesson 16: Applying the Properties of Operations to Multiply and Divide Rational Numbers |
| | d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. | | G7 M2 Lesson 14: Converting Rational Numbers to Decimals Using Long Division |

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| | **7.NS.A.3**<br><br>Solve mathematical problems and problems in real-world context involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions where $a/b \div c/d$ when $a$, $b$, $c$, and $d$ are all integers and $b$, $c$, and $d \neq 0$. | G7 M2 Lesson 15: Multiplication and Division of Rational Numbers<br><br>G7 M2 Lessons 18–19: Writing, Evaluating, and Finding Equivalent Expressions with Rational Numbers<br><br>G7 M2 Lesson 20: Investments—Performing Operations with Rational Numbers |
| **Expressions and Equations** | **Cluster: Use properties of operations to generate equivalent expressions.** | |
| | **7.EE.A.1**<br><br>Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. | G7 M3 Topic A: Use Properties of Operations to Generate Equivalent Expressions |
| | **7.EE.A.2**<br><br>Rewrite an expression in different forms, and understand the relationship between the different forms and their meanings in a problem context. | G7 M2 Lessons 18–19: Writing, Evaluating, and Finding Equivalent Expressions with Rational Numbers<br><br>G7 M3 Lessons 3–4: Writing Products as Sums and Sums as Products |
| | **Cluster: Solve mathematical problems and problems in real-world context using numerical and algebraic expressions and equations.** | |
| | **7.EE.B.3**<br><br>Solve multi-step mathematical problems and problems in real-world context posed with positive and negative rational numbers in any form. Convert between forms as appropriate and assess the reasonableness of answers. | G7 M3 Topic B: Solve Problems Using Expressions, Equations, and Inequalities<br><br>G7 M4: Percent and Proportional Relationships |

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| | **7.EE.B.4**<br><br>Use variables to represent quantities in mathematical problems and problems in real-world context, and construct simple equations and inequalities to solve problems. | |
| | a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where $p$, $q$, and $r$ are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. | G7 M2 Lesson 17: Comparing Tape Diagram Solutions to Algebraic Solutions<br><br>G7 M2 Lessons 22–23: Solving Equations Using Algebra<br><br>G7 M3 Topic B: Solve Problems Using Expressions, Equations, and Inequalities<br><br>G7 M4 Lesson 10: Simple Interest<br><br>G7 M4 Lesson 11: Tax, Commissions, Fees, and Other Real-World Percent Applications<br><br>G7 M4 Lesson 17: Mixture Problems |
| | b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where $p$, $q$, and $r$ are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. | G7 M3 Lesson 12: Properties of Inequalities<br><br>G7 M3 Lesson 13: Inequalities<br><br>G7 M3 Lesson 14: Solving Inequalities<br><br>G7 M3 Lesson 15: Graphing Solutions to Inequalities |

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| **Geometry** | **Cluster: Draw, construct, and describe geometrical figures and describe the relationships between them.** | |
| | **7.G.A.1** Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. | G7 M1 Topic D: Ratios of Scale Drawings<br><br>G7 M4 Topic C: Scale Drawings |
| | **7.G.A.2** Draw geometric shapes with given conditions using a variety of methods. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. | G7 M6 Topic B: Constructing Triangles |
| | **7.G.A.3** Describe the two-dimensional figures that result from slicing three-dimensional figures. | G7 M6 Topic C: Slicing Solids |

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| | **Cluster: Solve mathematical problems and problems in real-world context involving angle measure, area, surface area, and volume.** | |
| | **7.G.B.4**<br><br>Understand and use the formulas for the area and circumference of a circle to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. | G7 M3 Lesson 16: The Most Famous Ratio of All<br><br>G7 M3 Lesson 17: The Area of a Circle<br><br>G7 M3 Lesson 18: More Problems on Area and Circumference<br><br>G7 M3 Lesson 20: Composite Area Problems |
| | **7.G.B.5**<br><br>Use facts about supplementary, complementary, vertical, and adjacent angles in multi-step problems to write and solve simple equations for an unknown angle in a figure. | G7 M3 Lessons 10–11: Angle Problems and Solving Equations<br><br>G7 M6 Topic A: Unknown Angles |
| | **7.G.B.6**<br><br>Solve mathematical problems and problems in a real-world context involving area of two-dimensional objects composed of triangles, quadrilaterals, and other polygons. Solve mathematical problems and problems in real-world context involving volume and surface area of three-dimensional objects composed of cubes and right prisms. | G7 M3 Topic C: Use Equations and Inequalities to Solve Geometry Problems<br><br>G7 M6 Topic D: Problems Involving Area and Surface Area<br><br>G7 M6 Topic E: Problems Involving Volume |

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| **Statistics and Probability** | **Cluster: Use random sampling to draw inferences about a population.** | |
| | **7.SP.A.1**<br><br>Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. | G7 M5 Topic C: Random Sampling and Estimating Population Characteristics |
| | **7.SP.A.2**<br><br>Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. | G7 M5 Topic C: Random Sampling and Estimating Population Characteristics |
| | **Cluster: Draw informal comparative inferences about two populations.** | |
| | **7.SP.B.3**<br><br>Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. | G7 M5 Topic D: Comparing Populations |

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| | **7.SP.B.4**<br><br>Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. | G7 M5 Topic D: Comparing Populations |
| | **Cluster: Investigate chance processes and develop, use and evaluate probability models.** | |
| | **7.SP.C.5**<br><br>Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. | G7 M5 Lesson 1: Chance Experiments |
| | **7.SP.C.6**<br><br>Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. | G7 M5 Topic A: Calculating and Interpreting Probabilities<br><br>G7 M5 Lesson 8: The Difference Between Theoretical Probabilities and Estimated Probabilities<br><br>G7 M5 Lesson 12: Applying Probability to Make Informed Decisions |

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| | **7.SP.C.7**<br>Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies. If the agreement is not good, explain possible sources of the discrepancy. | | |
| | a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. | | G7 M5 Lesson 4: Calculating Probabilities for Chance Experiments with Equally Likely Outcomes |
| | b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. | | G7 M5 Lesson 5: Chance Experiments with Outcomes That Are Not Equally Likely<br><br>G7 M5 Lesson 8: The Difference Between Theoretical Probabilities and Estimated Probabilities<br><br>G7 M5 Lesson 9: Comparing Estimated Probabilities to Probabilities Predicted by a Model<br><br>G7 M5 Lesson 12: Applying Probability to Make Informed Decisions |