# Grade 5 | Georgia's K–12 Mathematics Standards Correlation to *Eureka Math*®

## About *Eureka Math*

Created by Great Minds®, a mission-driven Public Benefit Corporation, *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

Great Minds offers detailed analyses that 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

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

## Standards for Mathematical Practice

**MP.1**

Make sense of problems and persevere in solving them.

**MP.2**

Reason abstractly and quantitatively.

**MP.3**

Construct viable arguments and critique the reasoning of others.

**MP.4**

Model with mathematics.

**MP.5**

Use appropriate tools strategically.

**MP.6**

Attend to precision.

**MP.7**

Look for and make use of structure.

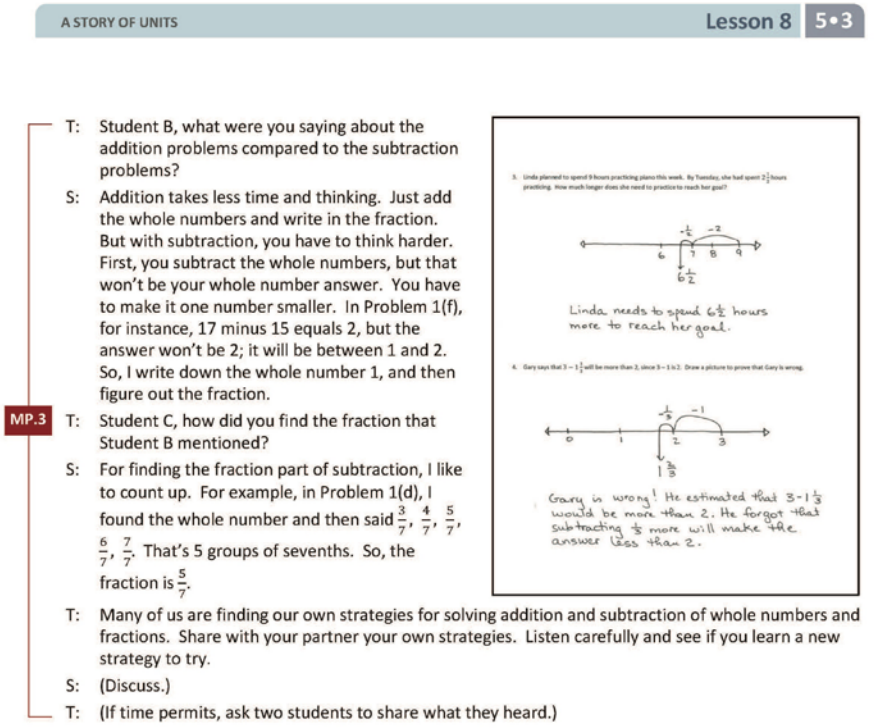
**MP.8**

Look for and express regularity in repeated reasoning.

## Aligned Components of *Eureka Math*

Lessons in every module engage students in mathematical practices. These are designated in the Module Overview and labeled in lessons.

For example:



A STORY OF UNITS Lesson 8 5•3

T: Student B, what were you saying about the addition problems compared to the subtraction problems?

S: Addition takes less time and thinking. Just add the whole numbers and write in the fraction. But with subtraction, you have to think harder. First, you subtract the whole numbers, but that won't be your whole number answer. You have to make it one number smaller. In Problem 1(f), for instance, 17 minus 15 equals 2, but the answer won't be 2; it will be between 1 and 2. So, I write down the whole number 1, and then figure out the fraction.

MP.3 T: Student C, how did you find the fraction that Student B mentioned?

S: For finding the fraction part of subtraction, I like to count up. For example, in Problem 1(d), I found the whole number and then said $\frac{3}{7}$, $\frac{4}{7}$, $\frac{5}{7}$, $\frac{6}{7}$, $\frac{7}{7}$. That's 5 groups of sevenths. So, the fraction is $\frac{5}{7}$.



T: Many of us are finding our own strategies for solving addition and subtraction of whole numbers and fractions. Share with your partner your own strategies. Listen carefully and see if you learn a new strategy to try.

S: (Discuss.)

T: (If time permits, ask two students to share what they heard.)

| Mathematical Modeling Framework | Aligned Components of *Eureka Math* |
|---|---|
| **MF.1**<br>Explore and describe real-life, mathematical situations or problems. | Lessons in every module engage students in mathematical modeling. |
| **MF.2**<br>Gather information, make assumptions, and define variables related to the problem. | |
| **MF.3**<br>Create a model and arrive at a solution to explain the problem presented. | |
| **MF.4**<br>Analyze and revise models, as necessary. | |
| **MF.5**<br>Evaluate the model and interpret solutions generated from other models. Draw and validate conclusions. | |

| Framework for Statistical Reasoning | Aligned Components of *Eureka Math* |
|---|---|
| **SR**<br>Create statistical investigative questions that can be answered by using quantitative (numerical) and categorical data. Determine strategies for gathering data to answer questions. Collect, analyze, and interpret data presented on dot plots and bar graphs from real situations to answer questions about the data distribution, spread, and center. | Lessons in Module 4 engage students in statistical reasoning.<br>*Supplemental material is necessary to fully address the Framework for Statistical Reasoning.* |
| **SR.1**<br>Ask: Create a statistical investigative question that can be answered by gathering data from real situations. | |
| **SR.2**<br>Collect: Develop up to five survey questions that would yield the data needed to answer the statistical investigative question. | |
| **SR.3**<br>Analyze: Graphically represent and describe the distribution of the numerical data through dot plots and line plots or categorical data through bar graphs. | |
| **SR.4**<br>Interpret: Describe and interpret the center of the distribution by the equal share value (mean). | |

## Numerical Reasoning—place value, multiplying by powers of 10, multiplication and division of multi-digit numbers, fractions, decimal numbers, numerical expressions

**5.NR.1 Use place value understanding to solve real-life, mathematical problems.**

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.NR.1.1**<br>Explain that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left. | G5 M1 Lesson 1: Reason concretely and pictorially using place value understanding to relate adjacent base ten units from millions to thousandths.<br>G5 M1 Lesson 2: Reason abstractly using place value understanding to relate adjacent base ten units from millions to thousandths.<br>G5 M2 Topic A: Mental Strategies for Multi-Digit Whole Number Multiplication<br>G5 M2 Lesson 16: Use divide by 10 patterns for multi-digit whole number division. |
| **5.NR.1.2**<br>Explain patterns in the placement of digits when multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10, up to $10^3$. | G5 M1 Lesson 3: Use exponents to name place value units and explain patterns in the placement of the decimal point.<br>G5 M1 Lesson 4: Use exponents to denote powers of 10 with application to metric conversions.<br>G5 M1 Lesson 12: Multiply a decimal fraction by single-digit whole numbers, including using estimation to confirm the placement of the decimal point.<br>G5 M2 Topic A: Mental Strategies for Multi-Digit Whole Number Multiplication<br>G5 M2 Lesson 16: Use divide by 10 patterns for multi-digit whole number division.<br>G5 M2 Lesson 24: Divide decimal dividends by multiples of 10, reasoning about the placement of the decimal point and making connections to a written method. |

## Numerical Reasoning—place value, multiplying by powers of 10, multiplication and division of multi-digit numbers, fractions, decimal numbers, numerical expressions

**5.NR.2 Multiply and divide multi-digit whole numbers to solve relevant, mathematical problems.**

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.NR.2.1**<br>Fluently multiply multi-digit (up to 3-digit by 2-digit) whole numbers to solve authentic problems. | G5 M2 Lesson 5: Connect visual models and the distributive property to partial products of the standard algorithm without renaming.<br>G5 M2 Lesson 6: Connect area models and the distributive property to partial products of the standard algorithm with renaming.<br>G5 M2 Lesson 9: Fluently multiply multi-digit whole numbers using the standard algorithm to solve multi-step word problems.<br>G5 M2 Lesson 13: Use whole number multiplication to express equivalent measurements.<br>G5 M2 Lesson 15: Solve two-step word problems involving measurement conversions.<br>G5 M6 Lesson 26: Solidify writing and interpreting numerical expressions. |
| **5.NR.2.2**<br>Fluently divide multi-digit whole numbers (up to 4-digit dividends and 2-digit divisors no greater than 25) to solve practical problems. | G5 M2 Topic E: Mental Strategies for Multi-Digit Whole Number Division<br>G5 M2 Topic F: Partial Quotients and Multi-Digit Whole Number Division<br>G5 M2 Lesson 28: Solve division word problems involving multi-digit division with group size unknown and the number of groups unknown.<br>G5 M6 Lesson 26: Solidify writing and interpreting numerical expressions. |

## Numerical Reasoning—place value, multiplying by powers of 10, multiplication and division of multi-digit numbers, fractions, decimal numbers, numerical expressions

**5.NR.3 Describe fractions and perform operations with fractions to solve relevant, mathematical problems using part-whole strategies and visual models.**

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.NR.3.1**<br>Explain the meaning of a fraction as division of the numerator by the denominator ($\frac{a}{b} = a \div b$). Solve problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers. | G5 M4 Topic B: Fractions as Division<br>G5 M6 Topic E: Multi-Step Word Problems<br>G5 M6 Lesson 28: Solidify fluency with Grade 5 skills. |
| **5.NR.3.2**<br>Compare and order up to three fractions with different numerators and/or different denominators by flexibly using a variety of tools and strategies. | G4 M5 Topic C: Fraction Comparison<br>G4 M5 Lesson 26: Compare fractions greater than 1 by reasoning using benchmark fractions.<br>G4 M5 Lesson 27: Compare fractions greater than 1 by creating common numerators or denominators.<br>G4 M5 Lesson 28: Solve word problems with line plots.<br>*Supplemental material is necessary to fully address this standard.* |
| **5.NR.3.3**<br>Model and solve problems involving addition and subtraction of fractions and mixed numbers with unlike denominators. | G4 M5 Lesson 20: Use visual models to add two fractions with related units using the denominators 2, 3, 4, 5, 6, 8, 10, and 12.<br>G4 M5 Lesson 21: Use visual models to add two fractions with related units using the denominators 2, 3, 4, 5, 6, 8, 10, and 12.<br>G5 M3 Lesson 3: Add fractions with unlike units using the strategy of creating equivalent fractions.<br>G5 M3 Lesson 4: Add fractions with sums between 1 and 2.<br>G5 M3 Lesson 5: Subtract fractions with unlike units using the strategy of creating equivalent fractions.<br>G5 M3 Lesson 6: Subtract fractions from numbers between 1 and 2. |

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.NR.3.3** ***continued*** | G5 M3 Topic C: Making Like Units Numerically<br>G5 M3 Lesson 14: Strategize to solve multi-term problems.<br>G5 M6 Lesson 26: Solidify writing and interpreting numerical expressions.<br>G5 M6 Lesson 27: Solidify writing and interpreting numerical expressions. |
| **5.NR.3.4**<br>Model and solve problems involving multiplication of a fraction and a whole number. | G4 M5 Lesson 3: Decompose non-unit fractions and represent them as a whole number times a unit fraction using tape diagrams.<br>G4 M5 Lesson 4: Decompose fractions into sums of smaller unit fractions using tape diagrams.<br>G4 M5 Lesson 5: Decompose unit fractions using area models to show equivalence.<br>G4 M5 Lesson 6: Decompose fractions using area models to show equivalence.<br>G4 M5 Lesson 23: Add and multiply unit fractions to build fractions greater than $1$ using visual models.<br>G4 M5 Lesson 25: Decompose and compose fractions greater than $1$ to express them in various forms.<br>G4 M5 Topic G: Repeated Addition of Fractions as Multiplication<br>G5 M4 Lesson 6: Relate fractions as division to fraction of a set.<br>G5 M4 Lesson 7: Multiply any whole number by a fraction using tape diagrams.<br>G5 M4 Lesson 8: Relate a fraction of a set to the repeated addition interpretation of fraction multiplication.<br>G5 M4 Lesson 10: Compare and evaluate expressions with parentheses.<br>G5 M4 Lesson 13: Multiply unit fractions by unit fractions.<br>G5 M4 Lesson 14: Multiply unit fractions by non-unit fractions.<br>G5 M4 Lesson 15: Multiply non-unit fractions by non-unit fractions.<br>G5 M4 Lesson 17: Relate decimal and fraction multiplication.<br>G5 M4 Lesson 18: Relate decimal and fraction multiplication. |

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|---|---|
| **5.NR.3.4** ***continued*** | G5 M4 Lesson 33: Create story contexts for numerical expressions and tape diagrams, and solve word problems.<br>G5 M6 Lesson 26: Solidify writing and interpreting numerical expressions.<br>G5 M6 Lesson 27: Solidify writing and interpreting numerical expressions.<br>G5 M6 Lesson 28: Solidify fluency with Grade 5 skills. |
| **5.NR.3.5**<br>Explain why multiplying a whole number by a fraction greater than one results in a product greater than the whole number, and why multiplying a whole number by a fraction less than one results in a product less than the whole number and multiplying a whole number by a fraction equal to one results in a product equal to the whole number. | G5 M4 Lesson 21: Explain the size of the product, and relate fraction and decimal equivalence to multiplying a fraction by 1.<br>G5 M4 Lesson 22: Compare the size of the product to the size of the factors.<br>G5 M4 Lesson 23: Compare the size of the product to the size of the factors. |
| **5.NR.3.6**<br>Model and solve problems involving division of a unit fraction by a whole number and a whole number by a unit fraction. | G5 M4 Lesson 25: Divide a whole number by a unit fraction.<br>G5 M4 Lesson 26: Divide a unit fraction by a whole number.<br>G5 M6 Lesson 28: Solidify fluency with Grade 5 skills. |

## Numerical Reasoning—place value, multiplying by powers of 10, multiplication and division of multi-digit numbers, fractions, decimal numbers, numerical expressions

**5.NR.4 Read, write, and compare decimal numbers to the thousandths place, and round and perform operations with decimal numbers to the hundredths place to solve relevant, mathematical problems.**

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.NR.4.1**<br>Read and write decimal numbers to the thousandths place using base ten numerals written in standard form and expanded form. | G5 M1 Lesson 5: Name decimal fractions in expanded, unit, and word forms by applying place value reasoning.<br>G5 M1 Topic D: Adding and Subtracting Decimals<br>G5 M1 Topic E: Multiplying Decimals<br>G5 M6 Lesson 28: Solidify fluency with Grade 5 skills. |
| **5.NR.4.2**<br>Represent, compare, and order decimal numbers to the thousandths place based on the meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons. | G5 M1 Lesson 6: Compare decimal fractions to the thousandths using like units, and express comparisons with $>$, $<$, $=$.<br>G5 M6 Lesson 28: Solidify fluency with Grade 5 skills. |
| **5.NR.4.3**<br>Use place value understanding to round decimal numbers to the hundredths place. | G5 M1 Topic C: Place Value and Rounding Decimal Fractions<br>G5 M6 Lesson 28: Solidify fluency with Grade 5 skills. |
| **5.NR.4.4**<br>Solve problems involving addition and subtraction of decimal numbers to the hundredths place using a variety of strategies. | G5 M1 Topic D: Adding and Subtracting Decimals<br>G5 M6 Lesson 26: Solidify writing and interpreting numerical expressions.<br>G5 M6 Lesson 28: Solidify fluency with Grade 5 skills. |

## Numerical Reasoning—place value, multiplying by powers of 10, multiplication and division of multi-digit numbers, fractions, decimal numbers, numerical expressions

**5.NR.5 Write, interpret, and evaluate numerical expressions within authentic problems.**

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.NR.5.1**<br>Write, interpret, and evaluate simple numerical expressions involving whole numbers with or without grouping symbols to represent actual situations. | G5 M2 Lesson 3: Write and interpret numerical expressions, and compare expressions using a visual model.<br>G5 M2 Lesson 4: Convert numerical expressions into unit form as a mental strategy for multi-digit multiplication.<br>G5 M4 Lesson 10: Compare and evaluate expressions with parentheses.<br>G5 M4 Lesson 32: Interpret and evaluate numerical expressions including the language of scaling and fraction division.<br>G5 M6 Lesson 7: Plot points, use them to draw lines in the plane, and describe patterns within the coordinate pairs.<br>G5 M6 Lesson 8: Generate a number pattern from a given rule, and plot the points.<br>G5 M6 Lesson 9: Generate two number patterns from given rules, plot the points, and analyze the patterns.<br>G5 M6 Lesson 26: Solidify writing and interpreting numerical expressions.<br>G5 M6 Lesson 27: Solidify writing and interpreting numerical expressions. |

## Patterning & Algebraic Reasoning—generating patterns, plotting ordered pairs in the first quadrant

**5.PAR.6 Solve relevant problems by creating and analyzing numerical patterns using the given rule(s).**

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.PAR.6.1**<br>Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms by completing a table. | G5 M6 Topic B: Patterns in the Coordinate Plane and Graphing Number Patterns from Rules<br>G5 M6 Lesson 18: Draw symmetric figures on the coordinate plane.<br>G5 M6 Lesson 31: Explore the Fibonacci sequence.<br>G5 M6 Lesson 32: Explore patterns in saving money. |
| **5.PAR.6.2**<br>Represent problems by plotting ordered pairs and explain coordinate values of points in the first quadrant of the coordinate plane. | G5 M6 Topic A: Coordinate Systems<br>G5 M6 Lesson 7: Plot points, use them to draw lines in the plane, and describe patterns within the coordinate pairs.<br>G5 M6 Lesson 14: Construct parallel line segments, and analyze relationships of the coordinate pairs.<br>G5 M6 Lesson 16: Construct perpendicular line segments, and analyze relationships of the coordinate pairs.<br>G5 M6 Lesson 19: Plot data on line graphs and analyze trends.<br>G5 M6 Lesson 20: Use coordinate systems to solve real world problems. |

## Measurement & Data Reasoning—measurements within the metric system, measurement conversions and time as a unit of measurement

**5.MDR.7 Solve problems involving customary measurements, metric measurements, and time and analyze graphical displays of data to answer relevant questions.**

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.MDR.7.1**<br>Explore realistic problems involving different units of measurement, including distance, mass, weight, volume, and time. | G5 M1 Lesson 4: Use exponents to denote powers of 10 with application to metric conversions.<br>G5 M2 Topic D: Measurement Word Problems with Whole Number and Decimal Multiplication<br>G5 M4 Lesson 8: Relate a fraction of a set to the repeated addition interpretation of fraction multiplication.<br>G5 M4 Lesson 9: Find a fraction of a measurement, and solve word problems.<br>G5 M4 Lesson 19: Convert measures involving whole numbers, and solve multi-step word problems.<br>G5 M4 Lesson 20: Convert mixed unit measurements, and solve multi-step word problems.<br>G5 M6 Lesson 21: Make sense of complex, multi-step problems, and persevere in solving them. Share and critique peer solutions.<br>G5 M6 Lesson 28: Solidify fluency with Grade 5 skills. |
| **5.MDR.7.2**<br>Ask questions and answer them based on gathered information, observations, and appropriate graphical displays to solve problems relevant to everyday life. | G5 M4 Topic A: Line Plots of Fraction Measurements<br>G5 M6 Lesson 19: Plot data on line graphs and analyze trends.<br>G5 M6 Lesson 20: Use coordinate systems to solve real-world problems.<br>*Supplemental material is necessary to fully address this standard.* |

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.MDR.7.3**<br>Convert among units within the metric system and then apply these conversions to solve multistep, practical problems. | G5 M1 Lesson 4: Use exponents to denote powers of 10 with application to metric conversions.<br>G5 M2 Topic D: Measurement Word Problems with Whole Number and Decimal Multiplication<br>G5 M4 Lesson 8: Relate a fraction of a set to the repeated addition interpretation of fraction multiplication.<br>G5 M4 Lesson 9: Find a fraction of a measurement, and solve word problems.<br>G5 M4 Lesson 19: Convert measures involving whole numbers, and solve multi-step word problems. |
| **5.MDR.7.4**<br>Convert among units within relative sizes of measurement units within the customary measurement system. | G5 M2 Topic D: Measurement Word Problems with Whole Number and Decimal Multiplication<br>G5 M4 Lesson 9: Find a fraction of a measurement, and solve word problems.<br>G5 M4 Lesson 19: Convert measures involving whole numbers, and solve multi-step word problems.<br>G5 M4 Lesson 20: Convert mixed unit measurements, and solve multi-step word problems.<br>G5 M6 Lesson 21: Make sense of complex, multi-step problems, and persevere in solving them. Share and critique peer solutions.<br>G5 M6 Lesson 28: Solidify fluency with Grade 5 skills. |

## Geometric & Spatial Reasoning—Properties of polygons and rectangular prisms, classify polygons

**5.GSR.8 Examine properties of polygons and rectangular prisms, classify polygons by their properties, and discover volume of right rectangular prisms.**

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.GSR.8.1**<br>Classify, compare, and contrast polygons based on properties. | G5 M5 Lesson 20: Classify two-dimensional figures in a hierarchy based on properties.<br>G5 M5 Lesson 21: Draw and identify varied two-dimensional figures from given attributes. |

| Georgia's K–12 Mathematics Standards | Aligned Components of *Eureka Math* |
|---|---|
| **5.GSR.8.2**<br>Determine, through exploration and investigation, that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. | G5 M5 Lesson 16: Draw trapezoids to clarify their attributes, and define trapezoids based on those attributes.<br>G5 M5 Lesson 17: Draw parallelograms to clarify their attributes, and define parallelograms based on those attributes.<br>G5 M5 Lesson 18: Draw rectangles and rhombuses to clarify their attributes, and define rectangles and rhombuses based on those attributes.<br>G5 M5 Lesson 19: Draw kites and squares to clarify their attributes, and define kites and squares based on those attributes.<br>G5 M6 Lesson 29: Solidify the vocabulary of geometry.<br>G5 M6 Lesson 30: Solidify the vocabulary of geometry. |
| **5.GSR.8.3**<br>Investigate volume of right rectangular prisms by packing them with unit cubes without gaps or overlaps. Then, determine the total volume to solve problems. | G5 M5 Topic A: Concepts of Volume<br>G5 M5 Lesson 4: Use multiplication to calculate volume.<br>G5 M5 Lesson 5: Use multiplication to connect volume as packing with volume as filling. |
| **5.GSR.8.4**<br>Discover and explain how the volume of a right rectangular prism can be found by multiplying the area of the base times the height to solve authentic, mathematical problems. | G5 M5 Lesson 3: Compose and decompose right rectangular prisms using layers.<br>G5 M5 Lesson 4: Use multiplication to calculate volume.<br>G5 M5 Lesson 5: Use multiplication to connect volume as packing with volume as filling.<br>G5 M5 Lesson 7: Solve word problems involving the volume of rectangular prisms with whole number edge lengths.<br>G5 M6 Lesson 28: Solidify fluency with Grade 5 skills.<br>G5 M6 Lesson 33: Design and construct boxes to house materials for summer use.<br>G5 M6 Lesson 34: Design and construct boxes to house materials for summer use. |