

A photograph of a classroom with two wooden desks. Each desk has a black top and a white sheet of paper. A pencil lies on each desk. In the background, there is a whiteboard and a colorful abacus.

**DRAFT New Louisiana
Standards for 2016-2017
Correlation to *Eureka Math***

Grade 6
April 2016
Draft

**EUREKA
MATH™**

Grade 6 Mathematics

The Grade 6 Louisiana Standards for Mathematics are fully covered by the Grade 6 *Eureka Math* curriculum. A detailed analysis of alignment is provided in the table below.

Indicators

-  Green indicates that the Louisiana standard is fully addressed in *Eureka Math*.
-  Yellow indicates that the Louisiana standard may not be completely addressed in *Eureka Math*.
-  Red indicates that the Louisiana 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 Louisiana standards and in *Eureka Math*.

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

1. Make sense of problems and persevere in solving them.

In grade 6, students solve problems involving ratios and rates and discuss how they solved them. Students solve real world problems through the application of algebraic and geometric concepts. Students seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves, “What is the most efficient way to solve the problem?”, “Does this make sense?”, and “Can I solve the problem in a different way?”

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

- G6 M1: Ratios and Unit Rates
- G6 M2: Arithmetic Operations Including Division of Fractions
- G6 M5: Area, Surface Area, and Volume Problems
- G6 M6: Statistics

2. Reason abstractly and quantitatively.

In grade 6, students represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.

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

- G6 M1: Ratios and Unit Rates
- G6 M2: Arithmetic Operations Including Division of Fractions
- G6 M3: Rational Numbers
- G6 M4: Expressions and Equations
- G6 M6: Statistics

3. Construct viable arguments and critique the reasoning of others.

In grade 6, students construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). They further refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. They pose questions like “How did you get that?”, “Why is that true?” “Does that always work?” They explain their thinking to others and respond to others’ thinking.

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

- G6 M5: Area, Surface Area, and Volume Problems
- G6 M6: Statistics

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

4. Model with mathematics.

In grade 6, students model problem situations symbolically, graphically, tabularly, and contextually. Students form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Students begin to explore covariance and represent two quantities simultaneously. Students use number lines to compare numbers and represent inequalities. They use measures of center and variability and data displays (i.e. box plots and histograms) to draw inferences about and make comparisons between data sets.

Students need many opportunities to connect and explain the connections between the different representations. They should be able to use all of these representations as appropriate to a problem context.

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

- G6 M3: Rational Numbers
- G6 M5: Area, Surface Area, and Volume Problems
- G6 M6: Statistics

5. Use appropriate tools strategically.

Students consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 6 may decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data. Additionally, students might use physical objects or applets to construct nets and calculate the surface area of three dimensional figures.

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

- G6 M1: Ratios and Unit Rates

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

6. Attend to precision.

In grade 6, students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students use appropriate terminology when referring to rates, ratios, geometric figures, data displays, and components of expressions, equations or inequalities.

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

- G6 M1: Ratios and Unit Rates
- G6 M2: Arithmetic Operations Including Division of Fractions
- G6 M3: Rational Numbers
- G6 M4: Expressions and Equations
- G6 M5: Area, Surface Area, and Volume Problems
- G6 M6: Statistics

7. Look for and make use of structure.

Students routinely seek patterns or structures to model and solve problems. For instance, students recognize patterns that exist in ratio tables recognizing both the additive and multiplicative properties. Students apply properties to generate equivalent expressions (i.e. $6 + 2x = 3(2 + x)$ by distributive property) and solve equations (i.e. $2c + 3 = 15$, $2c = 12$ by subtraction property of equality, and $c = 6$ by division property of equality). Students compose and decompose two- and three-dimensional figures to solve real world problems involving area and volume.

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

- G6 M1: Ratios and Unit Rates
- G6 M2: Arithmetic Operations Including Division of Fractions
- G6M3: Rational Numbers
- G6 M4: Expressions and Equations

Standards for Mathematical Practice

8. Look for and express regularity in repeated reasoning.

In grade 6, students use repeated reasoning to understand algorithms and make generalizations about patterns. During multiple opportunities to solve and model problems, they may notice that $a/b \div c/d = ad/bc$ and construct other examples and models that confirm their generalization. Students connect place value and their prior work with operations to understand algorithms to fluently divide multi-digit numbers and perform all operations with multi-digit decimals. Students informally begin to make connections between covariance, rates, and representations showing the relationships between quantities.

Aligned Components of *Eureka Math*

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

- G6 M2: Arithmetic Operations Including Division of Fractions
- G6 M4: Expressions and Equations

Domain	Standards	Aligned Components of <i>Eureka Math</i>
Ratios and Proportional Relationships	Cluster A: Understand ratio concepts and use ratio reasoning to solve problems.	
	6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. <i>For example, “The ratio of wings to beaks in the bird house at the zoo was 2: 1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”</i>	G6 M1 Lessons 1–2: Ratios
	6.RP.A.2 Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. <i>For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.”</i>	G6 M1 Lesson 16: From Ratios to Rates G6 M1 Lesson 17: From Rates to Ratios
	6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.	
	a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	G6 M1 Topic B: Collections of Equivalent Ratios

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>b. Solve unit rate problems including those involving unit pricing and constant speed. <i>For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what unit rate were lawns being mowed?</i></p>	G6 M1 Topic C: Unit Rates
	<p>c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.</p>	G6 M1 Topic D: Percent
	<p>d. Use a ratio reasoning to convert measurement units, manipulate and transform units appropriately when multiplying or dividing quantities.</p>	G6 M1 Lesson 18: Finding a Rate by Dividing Two Quantities
The Number System	<p>Cluster A: Apply and extend previous understandings of multiplication and division to divide fractions by fractions.</p> <p>6.NS.A.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. <i>For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $3/4$-cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi?</i></p>	G6 M2 Topic A: Dividing Fractions by Fractions

Domain

Standards

Aligned Components of *Eureka Math*

	<p>Cluster B: Compute fluently with multi-digit numbers and find common factors and multiples.</p>	
<p>6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.</p>	<p>G6 M2 Topic C: Dividing Whole Numbers and Decimals</p>	
<p>6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p>	<p>G6 M2 Topic B: Multi-Digit Decimal Operations—Adding, Subtracting, and Multiplying G6 M2 Topic C: Dividing Whole Numbers and Decimals</p>	
<p>6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. <i>For example, express $36 + 8$ as $4(9 + 2)$.</i></p>	<p>G6 M2 Lesson 18: Least Common Multiple and Greatest Common Factor G6 M4 Lesson 11: Factoring Expressions</p>	
	<p>Cluster C: Apply and extend previous understandings of numbers to the system of rational numbers.</p>	
<p>6.NS.C.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p>	<p>G6 M3 Lesson 1: Positive and Negative Numbers on the Number Line—Opposite Direction and Value G6 M3 Lessons 2–3: Real-World Positive and Negative Numbers and Zero</p>	

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.</p>	
	<p>a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.</p>	<p>G6 M3 Lesson 4: The Opposite of a Number G6 M3 Lesson 5: The Opposite of a Number's Opposite</p>
	<p>b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.</p>	<p>G6 M3 Topic C: Rational Numbers and the Coordinate Plane</p>
	<p>c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.</p>	<p>G6 M3: Rational Numbers</p>

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>6.NS.C.7 Understand ordering and absolute value of rational numbers.</p>	
	<p>a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.</p>	G6 M3 Topic B: Order and Absolute Value
	<p>b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ to express the fact that -3°C is warmer than -7°C.</p>	G6 M3 Topic B: Order and Absolute Value
	<p>c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write $-30 = 30$ to describe the size of the debt in dollars.</p>	G6 M3 Lesson 11: Absolute Value—Magnitude and Distance
	<p>d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.</p>	<p>G6 M3 Lesson 12: The Relationship Between Absolute Value and Order</p> <p>G6 M3 Lesson 13: Statements of Order in the Real World</p>

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>6.NS.C.8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.</p>	G6 M3 Topic C: Rational Numbers and the Coordinate Plane
Expressions and Equations	<p>Cluster A: Apply and extend previous understandings of arithmetic to algebraic expressions.</p>	
	<p>6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.</p>	G6 M4 Topic B: Special Notations of Operations
	<p>6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.</p>	
	<p>a. Write expressions that record operations with numbers and with letters standing for numbers. <i>For example, express the calculation “Subtract y from 5” as $5 - y$.</i></p>	<p>G6 M4 Lesson 9: Writing Addition and Subtraction Expressions</p> <p>G6 M4 Lessons 16–17: Write Expressions in Which Letters Stand for Numbers</p> <p>G6 M4 Topic F: Writing and Evaluating Expressions and Formulas</p>
	<p>b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. <i>For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.</i></p>	<p>G6 M4 Lessons 13–14: Writing Division Expressions</p> <p>G6 M4 Topic E: Expressing Operations in Algebraic Form</p>

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = \frac{1}{2}$.</i></p>	<p>G6 M4 Topic B: Special Notations of Operations G6 M4 Topic C: Replacing Letters and Numbers G6 M4 Topic F: Writing and Evaluating Expressions and Formulas</p>
	<p>6.EE.A.3 Apply the properties of operations to generate equivalent expressions. <i>For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.</i></p>	<p>G6 M4 Topic A: Relationships of the Operations G6 M4 Topic D: Expanding, Factoring, and Distributing Expressions</p>
	<p>6.EE.A.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). <i>For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.</i></p>	<p>G6 M4 Topic C: Replacing Letters and Numbers G6 M4 Topic D: Expanding, Factoring, and Distributing Expressions</p>

Domain

Standards

Aligned Components of *Eureka Math*

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>Cluster B: Reason about and solve one-variable equations and inequalities.</p> <p>6.EE.B.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p>6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.</p> <p>6.EE.B.7 Solve real-world and mathematical problems by writing and solving equations and inequalities of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers. Inequalities will include $<$, $>$, \leq, and \geq.</p> <p>6.EE.B.8 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.</p>	<p>G6 M4 Lessons 23–24: True and False Number Sentences</p> <p>G6 M4 Lesson 25: Finding Solutions to Make Equations True</p> <p>G6 M4 Lesson 33: From Equations to Inequalities</p> <p>G6 M4 Topic F: Writing and Evaluating Expressions and Formulas</p> <p>G6 M4 Topic G: Solving Equations</p> <p>G6 M4 Lesson 30: One-Step Problems in the Real World</p> <p>G6 M4 Lesson 33: From Equations to Inequalities</p> <p>G6 M4 Lesson 34: Writing and Graphing Inequalities in Real-World Problems</p>

Domain

Standards

Aligned Components of *Eureka Math*

	<p>Cluster C: Represent and analyze quantitative relationships between dependent and independent variables.</p>	
	<p>6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. <i>For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.</i></p>	<p>G6 M4 Lesson 31: Problems in Mathematical Terms G6 M4 Lesson 32: Multi-Step Problems in the Real World</p>
<p>Geometry</p>	<p>Cluster A: Solve real-world and mathematical problems involving area, surface area, and volume.</p>	
	<p>6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.</p>	<p>G6 M5 Topic A: Area of Triangles, Quadrilaterals, and Polygons</p>
	<p>6.G.A.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</p>	<p>G6 M5 Topic C: Volume of Right Rectangular Prisms G6 M5 Lesson 19: Surface Area and Volume in the Real World G6 M5 Lesson 19a: Addendum Lesson for Modeling—Applying Surface Area and Volume to Aquariums</p>

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</p>	G6 M5 Topic B: Polygons on the Coordinate Plane
	<p>6.G.A.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.</p>	G6 M5 Topic D: Nets and Surface Area
Statistics and Probability	<p>Cluster A: Develop understanding of statistical variability.</p>	
	<p>6.SP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. <i>For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.</i></p>	G6 M6 Lesson 1: Posing Statistical Questions G6 M6 Lesson 17: Developing a Statistical Project
	<p>6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution that can be described by its center, spread, and overall shape.</p>	G6 M6: Statistics

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>6.SP.A.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</p>	<p>G6 M6 Topic B: Summarizing a Distribution That Is Approximately Symmetric Using the Mean and Mean Absolute Deviation</p> <p>G6 M6 Topic C: Summarizing a Distribution That Is Skewed Using the Median and the Interquartile Range</p>
	<p>Cluster B: Summarize and describe distributions.</p>	
	<p>6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p>	<p>G6 M6: Statistics</p>
	<p>6.SP.B.5 Summarize numerical data sets in relation to their context, such as by:</p>	
	<p>a. Reporting the number of observations.</p>	<p>G6 M6 Lesson 14: Summarizing a Distribution Using a Box Plot</p> <p>G6 M6 Lesson 21: Summarizing a Data Distribution by Describing Center, Variability, and Shape</p>
	<p>b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement</p>	<p>G6 M6 Lesson 1: Posing Statistical Questions</p>

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.</p>	<p>G6 M6 Lesson 6: Describing the Center of a Distribution Using the Mean</p> <p>G6 M6 Lesson 7: The Mean as a Balance Point</p> <p>G6 M6 Lesson 8: Variability in a Data Distribution</p> <p>G6 M6 Topic C: Summarizing a Distribution That Is Skewed Using the Median and Interquartile Range</p>
	<p>d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.</p>	<p>G6 M6: Statistics</p>