

**NYS Grade 6 to Grade 8 Mathematics Learning Standards**

**Grade 6**

**Ratios and Proportional Relationships**

		Standard Code	Current Standard	Revised Standard Recommendation for 2018-19	Additional Information/Notes
<b>Clusters</b>	A. Understand ratio concepts and use ratio reasoning to solve problems.	6.RP.A.1	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>	1. No Change	
		6.RP.A.2	2. Understand the concept of a unit rate $a/b$ associated with a ratio $a:b$ with $b \neq 0$ ( $b$ not equal to zero), 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 <math>3/4</math> cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger." (Footnote: Expectations for unit rates in this grade are limited to non-complex fractions.)</i>	2. Understand the concept of a unit rate $a/b$ associated with a ratio $a:b$ with $b \neq 0$ ( $b$ not equal to zero), 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 <math>3/4</math> cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger." (Note: Expectations for unit rates in this grade are limited to non-complex fractions.)</i>	Clarification

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Clusters	A. Understand ratio concepts and use ratio reasoning to solve problems.	6.RP.A.3	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.	3. Use ratio and rate reasoning to solve real-world and mathematical problems, which includes, by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.	Clarification
		6.RP.A.3a	3a. 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.	3a. No Change	
		6.RP.A.3b	3b. 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 rate were lawns being mowed?</i>	3b. No Change	
		6.RP.A.3c	3c. 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.	3c. Know that a percent of a quantity is a rate per 100. For example, 30% of a quantity means 30/100 times the quantity. Solve problems involving finding the whole given a part and the percent, finding the percent given the part and the whole, and finding a part of a whole given the percent.	Clarification
		6.RP.A.3d	3d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	3d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. (Note: Conversion of units can occur within a given measurement system and across different measurement systems.)	

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**The Number System**

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<b>Clusters</b>	A. Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	6.NS.A.1	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 <math>(2/3) \div (3/4)</math> and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that <math>(2/3) \div (3/4) = 8/9</math> because <math>3/4</math> of <math>8/9</math> is <math>2/3</math>. (In general, <math>(a/b) \div (c/d) = ad/bc</math>.) How much chocolate will each person get if 3 people share <math>1/2</math> lb of chocolate equally? How many <math>3/4</math>-cup servings are in <math>2/3</math> of a cup of yogurt? How wide is a rectangular strip of land with length <math>3/4</math> mi and area <math>1/2</math> square mi?</i>	1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, which includes using visual fraction models, the standard algorithm, and equations to represent the problem. <i>For example, create a context for <math>(2/3) \div (3/4)</math> and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that <math>(2/3) \div (3/4) = 8/9</math> because <math>3/4</math> of <math>8/9</math> is <math>2/3</math>. How much chocolate will each person get if 3 people share <math>1/2</math> lb of chocolate equally? How many <math>3/4</math>-cup servings are in <math>2/3</math> of a cup of yogurt? How wide is a rectangular strip of land with length <math>3/4</math> mi and area <math>1/2</math> square mi? (In general, <math>(a/b) \div (c/d) = ad/bc</math>.)</i>	Clarification

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		<b>Standard Code</b>	<b>Current Standard</b>	<b>Revised Standard Recommendation for 2018-19</b>	<b>Additional Information/Notes</b>
<b>Clusters</b>	B. Compute fluently with multi-digit numbers and find common factors and multiples.	6.NS.B.2	2. Fluently divide multi-digit numbers using the standard algorithm.	2. No Change	Note: Multi-digit division is an expected fluency for grade 6.
		6.NS.B.3	3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	3. No Change	Note: Multi-digit decimal operations are an expected fluency in grade 6.
		6.NS.B.4	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 <math>36 + 8</math> as <math>4(9 + 2)</math>.</i>	4. No Change	

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<b>Clusters</b>	C. Apply and extend previous understandings of numbers to the system of rational numbers.	6.NS.C.5	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, debits/credits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. <i>For example, temperature above/below zero, elevation above/below sea level, debits/credits, positive/negative electric charge.</i>	Clarification
		6.NS.C.6	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.	6. No Change	
		6.NS.C.6a	6a. 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.	6a. 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. <i>For example, <math>-(-3) = 3</math>, and that 0 is its own opposite.</i>	Clarification
		6.NS.C.6b	6b. 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.	6b. 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. (Note: This standard is not intended to be the beginning of transformational geometry.)	Clarification
		6.NS.C.6c	6c. 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.	6c. No Change	

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<b>Clusters</b>	C. Apply and extend previous understandings of numbers to the system of rational numbers.	6.NS.C.7	7. Understand ordering and absolute value of rational numbers.	7. No Change	
		6.NS.C.7a	7a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. <i>For example, interpret <math>-3 &gt; -7</math> as a statement that <math>-3</math> is located to the right of <math>-7</math> on a number line oriented from left to right.</i>	7a. No Change	
		6.NS.C.7b	7b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. <i>For example, write <math>-3^{\circ}\text{C} &gt; -7^{\circ}\text{C}</math> to express the fact that <math>-3^{\circ}\text{C}</math> is warmer than <math>-7^{\circ}\text{C}</math>.</i>	7b. No Change	
		6.NS.C.7c	7c. 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. <i>For example, for an account balance of <math>-30</math> dollars, write <math> -30  = 30</math> to describe the size of the debt in dollars.</i>	7c. No Change	
		6.NS.C.7d	7d. Distinguish comparisons of absolute value from statements about order. <i>For example, recognize that an account balance less than <math>-30</math> dollars represents a debt greater than 30 dollars.</i>	7d. Distinguish comparisons of absolute value from statements about order. <i>For example, someone with a balance of <math>\\$100</math> in their bank account has more money than someone with a balance of <math>-\\$1000</math>, because <math>100 &gt; -1000</math>. But the second person's debt is much larger than the first person's credit because <math> -1000  &gt;  100 </math>.</i>	Clarification

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<b>Clusters</b> C. Apply and extend previous understandings of numbers to the system of rational numbers.	6.NS.C.8	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.	8. No Change	

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**Grade 6**

**Expressions and Equations (Inequalities)**

		Standard Code	Current Standard	Revised Standard Recommendation for 2018-19	Additional Information/Notes
Clusters	A. Apply and extend previous understandings of arithmetic to algebraic expressions.	6.EE.A.1	1. Write and evaluate numerical expressions involving whole-number exponents.	1. No Change	
		6.EE.A.2	2. Write, read, and evaluate expressions in which letters stand for numbers.	2. No Change	
		6.EE.A.2a	2a. Write expressions that record operations with numbers and with letters standing for numbers. <i>For example, express the calculation "Subtract y from 5" as <math>5 - y</math>.</i>	2a. No Change	
		6.EE.A.2b	2b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, and coefficient); view one or more parts of an expression as a single entity. <i>For example, describe the expression <math>2(8 + 7)</math> as a product of two factors; view <math>(8 + 7)</math> as both a single entity and a sum of two terms.</i>	2b. No Change	
		6.EE.A.2c	2c. Evaluate expressions at specific values for their variables. Include expressions that arise from formulas 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 <math>V = s^3</math> and <math>A = 6s^2</math> to find the volume and surface area of a cube with sides of length <math>s = 1/2</math>.</i>	2c. No Change	



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<b>Clusters</b>	A. Apply and extend previous understandings of arithmetic to algebraic expressions.	6.EE.A.3	3. Apply the properties of operations to generate equivalent expressions. <i>For example, apply the distributive property to the expression <math>3(2 + x)</math> to produce the equivalent expression <math>6 + 3x</math>; apply the distributive property to the expression <math>24x + 18y</math> to produce the equivalent expression <math>6(4x + 3y)</math>; apply properties of operations to <math>y + y + y</math> to produce the equivalent expression <math>3y</math>.</i>	3. No Change	
		6.EE.A.4	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 <math>y + y + y</math> and <math>3y</math> are equivalent because they name the same number regardless of which number <math>y</math> stands for.</i>	4. No Change	
	B. Reason about and solve one-variable equations and inequalities.	6.EE.B.5	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.	5. No Change	
		6.EE.B.6	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.	6. No Change	

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		Standard Code	Current Standard	Revised Standard Recommendation for 2018-19	Additional Information/Notes
<b>Clusters</b>	B. Reason about and solve one-variable equations and inequalities.	6.EE.B.7	7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which $p$ , $q$ and $x$ are all nonnegative rational numbers.	7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which $p$ , $q$ and $x$ are all nonnegative rational numbers and where $x$ represents the unknown quantity. (Note: This standard includes subtraction and division, the inverse operations of addition and multiplication.)	Clarification
		6.EE.B.8	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.	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. (Note: Inequalities using less than or equal to and greater than or equal to are included in this standard.)	Clarification
	C. Represent and analyze quantitative relationships between dependent and independent variables.	6.EE.C.9	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. 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.	9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; given an equation to express one quantity, identify 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. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and given the equation $d = 65t$ to represent the relationship between distance and time.	In this standard, “write an equation” is replaced with “given an equation” to limit the scope of the standard and allow focus on the importance of identifying dependent and independent variables given a particular real-world situation.

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**Grade 6  
Geometry**

	Standard Code	Current Standard	Revised Standard Recommendation for 2018-19	Additional Information/Notes
<b>Clusters</b> A. Solve real-world and mathematical problems involving area, surface area and volume.	6.G.A.1	1. Find 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.	1. Find area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other special quadrilaterals; apply these techniques in the context of solving real-world and mathematical problems. Explore square numbers through area.	This standard includes the development of square numbers through area. This leads to a conceptual understanding of square roots in grade 8.
	6.G.A.2	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 $V = l w h$ and $V = b h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	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 $V = l w h$ and $V = B h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. Explore cubic numbers through volume.	This standard includes the development of cubic numbers through volume. This leads to a conceptual understanding of cube roots in grade 8.  The volume formula is changed to $V = B h$ which identifies B as the area of the base.
	6.G.A.3	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.	3. No Change	
	6.G.4	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.	4. No Change	

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**Grade 6  
Statistics and Probability**

		<b>Standard Code</b>	<b>Current Standard</b>	<b>Revised Standard Recommendation for 2018-19</b>	<b>Additional Information/Notes</b>
<b>Clusters</b>	A. Develop understanding of statistical variability.	6.SP.A.1	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>	1. No Change	
		6.SP.A.2	2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	2. No Change	
		6.SP.A.3	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.	3. No Change	

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<b>Clusters</b>  B. Summarize and describe distributions.	6.SP.B.4	4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	4. No Change	
	6.SP.B.5	5. Summarize numerical data sets in relation to their context, such as by:	5. No Change	
	6.SP.B.5a	5a. Reporting the number of observations.	5a. No Change	
	6.SP.B.5b	5b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	5b. No Change	
	6.SP.B.5c	5c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data was gathered.	5c. No Change	
	6.SP.B.5d	5d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data was gathered.	5d. Understanding that the choice of measures of center and variability relates to the shape of the data distribution and the context in which the data was gathered.	