

Draft Mathematics Extensions  
for Aligning the New York State Alternate Assessment (NYSAA)  
to the Common Core State Standards (CCSS)

GRADE 6

# Mathematics – Grade 6

CCSS Domain: Ratios and Proportional Relationships		Page(s): 36
CCSS Code	Cluster (including Standard(s) within the Cluster)	Essence of Cluster (develop one Essence)
6.RP	<p><b>Understand ratio concepts and use ratio reasoning to solve problems.</b></p> <p>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></p> <p>2. Understand the concept of a unit rate <math>a/b</math> associated with a ratio <math>a:b</math> with <math>b \neq 0</math>, 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.”<sup>1</sup></i></p> <p>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.</p> <p>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.</p> <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 rate were lawns being mowed?</i></p> <p>c. Find a percent of a quantity as a rate per 100; e.g., 30% of a quantity means <math>30/100</math> times the quantity; solve problems involving finding the whole, given a part and the percent.</p> <p>d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.</p>	<p>Recognize, understand and solve ratios and rate in real-world problems.</p> <p>Understand the meaning of a ratio and rate.</p>

Extensions		
Less Complex	◀ ⋯ ⋯ ⋯ ▶	More Complex
Identify what a ratio(s) means in a real-world situation(s).	Generate a ratio statement(s) applied to a real-world problem(s).	Solve real-world problems involving ratio.
Assessment Tasks		
<ul style="list-style-type: none"> <li>The student will identify what a ratio(s) means in a real-world situation(s).</li> <li>The student will identify which set has more and/or less, given two sets of objects of different values.</li> <li>The student will identify how many objects have the requested characteristic, given 2 sets of objects with different characteristics (e.g., 4 blue dots, 3 red dots, teacher says “how many red?”).</li> </ul>	<ul style="list-style-type: none"> <li>The student will generate a ratio statement(s) applied to a real-world problem(s).</li> <li>The student will generate ratio statements, given information involving two or more quantities.</li> <li>The student will give ratio showing relationship between quantities of plants, given a garden with two kinds of plants (e.g., 4 tomatoes, 6 peppers, 4 to 6).</li> </ul>	<ul style="list-style-type: none"> <li>The student will determine the amount of one or more additional ingredients, based on the initial ratio given a recipe with 1 ingredient increased or decreased.</li> <li>The student will determine unit cost given a ratio based sale price (e.g., \$6 for 3 items).</li> <li>The student will give the percentage for each kind of plant, given a garden with two kinds of plants (4 tomatoes, 6 peppers, 40%, 60%).</li> </ul>
<p><b>Career Development and Occupational Studies (CDOS) skills crosswalk to the New York State Alternate Assessment (NYSAA) Essence statements and Extensions</b></p> <p>Career Development: Knowledge about the world of work, career options, personal skills, and abilities relating to future career decisions. For example,</p> <ul style="list-style-type: none"> <li>Understand the relationship between two entities (hours worked and amount of pay earned).</li> </ul> <p>Integrated Learning: Application of academic knowledge and skills to school, community and home settings. For example:</p> <ul style="list-style-type: none"> <li>Use skills learned to compare two sets of objects/quantities (kinds of plants in a garden).</li> </ul> <p>Universal Foundation Skills: Foundation skills and competencies necessary for success in the workplace. For example:</p> <ul style="list-style-type: none"> <li>Basic skill: Understand concepts of ratio when determining ideas, such as unit cost and percentages (sales, discounts).</li> </ul>		

# Mathematics – Grade 6

CCSS Domain: Expressions and Equations		Page(s): 38
CCSS Code	Cluster (including Standard(s) within the Cluster)	Essence of Cluster (develop one Essence)
6.EE	<p><b>Apply and extend previous understandings of arithmetic to algebraic expressions.</b></p> <ol style="list-style-type: none"> <li>1. Write and evaluate numerical expressions involving whole-number exponents.</li> <li>2. Write, read, and evaluate expressions in which letters stand for numbers.               <ol style="list-style-type: none"> <li>a. Write expressions that record operations with numbers and with letters standing for numbers. <i>For example, express the calculation “Subtract <math>y</math> from 5” as <math>5 - y</math>.</i></li> <li>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 <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></li> <li>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 <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 = \frac{1}{2}</math>.</i></li> </ol> </li> <li>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></li> <li>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></li> </ol>	Write, read and evaluate algebraic expressions.

Extensions		
Less Complex	◀ ⋯ ⋯ ⋯ ▶	More Complex
Given word(s), identify numbers, mathematical symbols, or algebraic expression.	Evaluate numeric and/or algebraic expressions.	Translate words into algebraic expressions, using variable(s), and then evaluate the expression.
Assessment Tasks		
<ul style="list-style-type: none"> <li>The student will identify numbers, mathematical symbols, or algebraic expression, given the corresponding word(s).</li> <li>The student will identify numbers, given the corresponding word(s).</li> <li>The student will identify mathematical symbols, given the corresponding word(s).</li> <li>The student will identify algebraic expression, given the corresponding word(s).</li> </ul>	<ul style="list-style-type: none"> <li>The student will evaluate numeric and/or algebraic expressions.</li> <li>The student will solve addition, subtraction, multiplication, and/or division expressions. (e.g., Presented horizontally, student may solve vertically).</li> <li>The student will substitute and solve the expression, given a formula and value of the variable, (e.g., <math>Y + Y + Y = ?</math>, <math>Y = 2</math>).</li> </ul>	<ul style="list-style-type: none"> <li>The student will translate words into algebraic expressions, using variable(s), and then evaluate the expression.</li> <li>The student will write an expression including variable and solve, given an item cost and desired quantity (e.g., tickets price is \$10, 4 people going, how much money do you need? <math>4Y = ?</math> <math>4(10) = 40</math>).</li> </ul>
<p><b>Career Development and Occupational Studies (CDOS) skills crosswalk to the New York State Alternate Assessment (NYSAA) Essence statements and Extensions</b></p> <p>Career Development: Knowledge about the world of work, career options, personal skills, and abilities relating to future career decisions. For example,</p> <ul style="list-style-type: none"> <li>Understand the relationship of the changing nature of various occupations and respective educational requirements.</li> </ul> <p>Integrated Learning: Application of academic knowledge and skills to school, community and home settings. For example:</p> <ul style="list-style-type: none"> <li>Use skills learned to solve real-world problems involving equations and expressions (determining how much change a person will have when buying several items).</li> </ul> <p>Universal Foundation Skills: Foundation skills and competencies necessary for success in the workplace. For example:</p> <ul style="list-style-type: none"> <li>Technology: Understand the proper use of technology, such as calculators, when solving problems.</li> <li>Thinking Skills: Translate oral and/or written problems to numerical expressions or equations and then solve (determine how many students chose a lunch item when given the amount spent).</li> </ul>		

# Mathematics – Grade 6

CCSS Domain: Expressions and Equations		Page(s): 38
CCSS Code	Cluster (including Standard(s) within the Cluster)	Essence of Cluster (develop one Essence)
6.EE	<p><b>Reason about and solve one-variable equations and inequalities.</b></p> <p>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. 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>7. Solve real-world and mathematical problems by writing and solving equations of the form <math>x + p = q</math> and <math>px = q</math> for cases in which <math>p</math>, <math>q</math> and <math>x</math> are all nonnegative rational numbers.</p> <p>8. Write an inequality of the form <math>x &gt; c</math> or <math>x &lt; c</math> to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form <math>x &gt; c</math> or <math>x &lt; c</math> have infinitely many solutions; represent solutions of such inequalities on number line diagrams.</p>	Solve simple algebraic equations and inequalities.

Extensions		
Less Complex	◀ ⋯ ⋯ ⋯ ▶	More Complex
Solve numeric equations and inequalities (e.g., $2+1=x$ ).	Determine if an equation(s) and/or inequality(s) is true when given a value. (For example, <i>Is it true the <math>y + 2 = 5</math> when <math>y = 3</math>?</i> ).	Solve algebraic equations and/or inequalities with the variable within the expression. (For example, $6 + x > 11$ ; $6 + x = 11$ ).
Assessment Tasks		
<ul style="list-style-type: none"> <li>The student will solve numeric equations and inequalities.</li> <li>The student will solve numeric equations.</li> <li>The student will solve numeric inequalities.</li> </ul>	<ul style="list-style-type: none"> <li>The student will determine if an equation(s) and/or inequality(s) is true when given a value.</li> <li>The student will determine whether the given equation(s) is true (correct or incorrect).</li> <li>The student will determine whether the given inequality(s) is true (correct or incorrect).</li> <li>The student will determine if equation(s) and inequality(s) are true using a balance scale and manipulatives (e.g., <math>1 + 2 = 7 + 1</math>, true or false? <math>3 + 2 = 2 + 3</math>, true or false?).</li> </ul>	<ul style="list-style-type: none"> <li>The student will solve algebraic equations and/or inequalities with the variable within the expression.</li> <li>The student will indicate the correct answer from a given set of choices for a given algebraic equation (e.g., <math>3 + Y = 5</math>).</li> <li>The student will indicate the correct answer from a set of choices for a given inequality (e.g., <math>6 + Y &gt; 11</math>).</li> <li>The student will solve equations and /or inequalities, using a balance scale and manipulatives.</li> </ul>
<b>Career Development and Occupational Studies (CDOS) skills crosswalk to the New York State Alternate Assessment (NYSAA) Essence statements and Extensions</b>		
<p>Career Development: Knowledge about the world of work, career options, personal skills, and abilities relating to future career decisions. For example,</p> <ul style="list-style-type: none"> <li>Understand the use of equations when evaluating career choices (If a car costs <math>z</math> and your pay is <math>y</math>, how long must you work to be able to buy that car?).</li> </ul> <p>Integrated Learning: Application of academic knowledge and skills to school, community and home settings. For example:</p> <ul style="list-style-type: none"> <li>Use skills learned about equations to determine when it is useful to construct and solve an equation (Should I use an equation to design a garden?).</li> </ul> <p>Universal Foundation Skills: Foundation skills and competencies necessary for success in the workplace. For example:</p> <ul style="list-style-type: none"> <li>Basic skills: demonstrate the ability to solve equations in a work situation (design a swimming pool when some of the dimensions are known).</li> </ul>		

# Mathematics – Grade 6

CCSS Domain: Geometry		Page(s): 39
CCSS Code	Cluster (including Standard(s) within the Cluster)	Essence of Cluster (develop one Essence)
<b>6.G</b>	<p><b>Solve real-world and mathematical problems involving area, surface area, and volume.</b></p> <ol style="list-style-type: none"> <li>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.</li> <li>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 <math>V = lwh</math> and <math>V = Bh</math> to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</li> <li>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.</li> <li>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.</li> </ol>	Solve real-world and mathematical problems involving area, surface area, and volume.
<b>Extensions</b>		
<p style="text-align: center;"> <span style="margin-right: 20px;"><b>Less Complex</b></span> <span style="margin-right: 20px;">◀ ⋯ ⋯ ⋯ ⋯ ⋯ ▶</span> <span><b>More Complex</b></span> </p>		
Identify geometric objects or figures with the same area and/or volume.	Determine area and/or volume of geometric figure(s).	Determine surface area and volume of a geometric figure.
<b>Assessment Tasks</b>		
<ul style="list-style-type: none"> <li>• The student will identify geometric objects or figures with the same area and/or volume.</li> <li>• The student will identify geometric objects or figures with the same area.</li> <li>• The student will identify geometric objects or figures with the same volume.</li> </ul>	<ul style="list-style-type: none"> <li>• The student will determine area and/or volume of geometric figure(s), given the figure(s), formula and dimensions.</li> <li>• The student will determine area and/or volume, using manipulatives of geometric figure(s).</li> <li>• The student will determine area, using an online tool (area calculator).</li> </ul>	<ul style="list-style-type: none"> <li>• The student will determine surface area and volume of geometric figure(s) given the formula for surface area and volume and the dimensions (e.g., surface area for liner and volume for water, given a swimming pools dimensions).</li> <li>• The student will determine surface area and volume of an object by determining the dimensions (formula may or may not be given).</li> </ul>

## **Career Development and Occupational Studies (CDOS) skills crosswalk to the New York State Alternate Assessment (NYSAA) Essence statements and Extensions**

Career Development: Knowledge about the world of work, career options, personal skills, and abilities relating to future career decisions. For example,

- Understand the concept of same and different when researching careers.

Integrated Learning: Application of academic knowledge and skills to school, community and home settings. For example:

- Use knowledge of determining area when planning projects such as rooms and gardens.

Universal Foundation Skills: Foundation skills and competencies necessary for success in the workplace. For example:

- Basic skills: Understand and use concepts of geometry (designing a structure, designing furniture placement).
- Thinking skills: Understand and use area/volume to complete a task.
- Managing Information: Follow directions to complete a task (plan a school store).

# Mathematics – Grade 6

<b>CCSS Domain:</b> The Number System		<b>Page(s):</b> 37
<b>CCSS Code</b>	<b>Cluster (including Standard(s) within the Cluster)</b>	<b>Essence of Cluster (develop one Essence)</b>

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**6.NS****Apply and extend previous understandings of numbers to the system of rational numbers.**

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.
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.
  - 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.
  - 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.
  - 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.
7. Understand ordering and absolute value of rational numbers.
  - 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.*
  - b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write  $-3\text{ }^{\circ}\text{C} > -7\text{ }^{\circ}\text{C}$  to express the fact that  $-3\text{ }^{\circ}\text{C}$  is warmer than  $-7\text{ }^{\circ}\text{C}$ .*
  - 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.*
  - 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.*
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.

Recognize and demonstrate that integers represent quantities and positions.

**Extensions****Less Complex****More Complex**

Plot and/or identify integers on a horizontal or vertical number line diagram.	Identify and/or plot points on a coordinate plane.	Solve real-world problems involving integers as related to quantities and positions on a coordinate grid (temperature, reading a map on a coordinate grid, credits/debits).
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**Assessment Tasks**

<ul style="list-style-type: none"> <li>The student will plot and/or identify integers on a horizontal or vertical number line diagram (e.g., given a temperature, the student will identify the thermometer that shows the correct temperature).</li> <li>The student will complete a number line.</li> <li>The student will locate requested numbers on a number line.</li> </ul>	<ul style="list-style-type: none"> <li>The student will identify and/or plot points on a coordinate plane (e.g., When playing a game using a coordinate plane, the student will place items of given points and/or identify coordinates of plotted items).</li> <li>The student will give coordinates for a requested location, given a map with a letter/number grid (e.g., Find the library on the map, student response: B5).</li> <li>The student will indicate coordinates for given coordinates on a grid.</li> </ul>	<ul style="list-style-type: none"> <li>The student will solve problems involving integers as related to quantities and positions on a coordinate grid (e.g., thermometer: change in temperature; bank statement: balance, credits, debits; map with distance between two points; elevation: difference between two elevations; stock market: weekly stock report).</li> </ul>
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**Career Development and Occupational Studies (CDOS) skills crosswalk to the New York State Alternate Assessment (NYSAA) Essence statements and Extensions**

Career Development: Knowledge about the world of work, career options, personal skills, and abilities relating to future career decisions. For example,

- Identify the role of numbers in various careers and their personal interest in working with numbers.

Integrated Learning: Application of academic knowledge and skills to school, community and home settings. For example:

- Apply knowledge of numbers to alter a recipe.
- Find a location on a map.

Universal Foundation Skills: Foundation skills and competencies necessary for success in the workplace. For example:

- Basic skills: Understand and use addition, subtraction, multiplication, and division to solve mathematical problem (determine a temperature on a given day).
- Thinking skills: Develop a realistic route between points on a map.