SECTION NINE: Draft 6th Grade Standards

9A: Introduction

Critical Areas for Grade 6 Mathematics

In Grade 6, instructional time should focus on four critical areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking.

1. Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.

2. Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.

3. Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as 3x = y) to describe relationships between quantities.

4. Building on and reinforcing their understanding of number, students begin to develop their ability to think statistically. Students recognize that a data distribution may not have a definite center and that different ways to measure center yield different values. The median measures center in the sense that it is roughly the middle value. The mean measures center in the sense that it is the value that each data point would take on if the total of the data values were redistributed equally, and also in the sense that it is a balance point. Students recognize that a measure of variability (interquartile range or mean absolute deviation) can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability.
Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected. Students in Grade 6 also build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

Grade 6 Overview

Ratios and Proportional Relationships
- Understand ratio concepts and use ratio reasoning to solve problems.

The Number System
- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Multiply and divide multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations
- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

Geometry
- Solve real-world and mathematical problems involving area, surface area, and volume.

Statistics and Probability
- Develop understanding of statistical variability.
- Summarize and describe distributions.

Mathematical Practices
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.
Highlights of Major Work in Grades K-8

K-2: Addition and subtraction – concepts, skills, and problem solving; place value
3-5: Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6: Ratios and proportional relationships; early expressions and equations
7: Ratios and proportional relationships; arithmetic of rational numbers
8: Linear algebra and linear functions

Grade 6 Fluency Standard(s)

6.NS.B.2 Multi-digit division
6.NS.B.3 Positive rational number operations, including fractions and multi-digit decimals
9B: Draft Standards Statements – Grade 6

The standards listed in the tables below list both core standards statements and cluster prioritization for K-8 mathematics. Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. (Link to Focus by Grade Level documents)

Students should spend the large majority of their time on the major work of the grade (重大项目). Supporting work (支持工作) and, where appropriate, additional work (附加工作) can engage students in the major work of the grade.

6.RP - Ratios & Proportional Relationships

6.RP.A - Understand ratio concepts and use ratio reasoning to solve problems.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Standards Statement (Jan 2021 Draft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.RP.A.1</td>
<td>Understand the concept of a ratio in authentic contexts, and use ratio language to describe a ratio relationship between two quantities.</td>
</tr>
<tr>
<td>6.RP.A.2</td>
<td>Understand the concept of a unit rate in authentic contexts and use rate language in the context of a ratio relationship.</td>
</tr>
<tr>
<td>6.RP.A.3</td>
<td>Use ratio and rate reasoning to solve problems in authentic contexts that use equivalent ratios, unit rates, percents, and measurement units.</td>
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</table>

6.NS - The Number System

6.NS.A - Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

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<tr>
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<tbody>
<tr>
<td>6.NS.A.1</td>
<td>Represent, interpret, and compute quotients of fractions to solve problems in authentic contexts involving division of fractions by fractions.</td>
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</table>

6.NS.B - Compute fluently with multi-digit numbers and find common factors and multiples.

<table>
<thead>
<tr>
<th>Standard</th>
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<tbody>
<tr>
<td>6.NS.B.2</td>
<td>Demonstrate fluency with division of multi-digit numbers using accurate, efficient, and flexible strategies and algorithms based on place value and properties of operations.</td>
</tr>
<tr>
<td>6.NS.B.3</td>
<td>Fluently add, subtract, multiply and divide fractions and multi-digit decimals using a standard algorithm for each operation.</td>
</tr>
<tr>
<td>6.NS.B.4</td>
<td>Apply the greatest common factor to 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.</td>
</tr>
</tbody>
</table>
### 6.NS.C - Apply and extend previous understandings of numbers to the system of rational numbers.

<table>
<thead>
<tr>
<th>Standard</th>
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<tbody>
<tr>
<td>6.NS.C.5</td>
<td>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 authentic contexts, explaining the meaning of zero in each situation.</td>
</tr>
<tr>
<td>6.NS.C.6</td>
<td>Represent 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.</td>
</tr>
<tr>
<td>6.NS.C.7</td>
<td>Understand ordering and absolute value of rational numbers. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. Write, interpret, and explain statements of order for rational numbers in authentic contexts.</td>
</tr>
<tr>
<td>6.NS.C.8</td>
<td>Graph points in all four quadrants of the coordinate plane to solve problems in authentic contexts. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.</td>
</tr>
</tbody>
</table>

### 6.EE - Expressions & Equations

#### 6.EE.A - Apply and extend previous understandings of arithmetic to algebraic expressions.

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<tbody>
<tr>
<td>6.EE.A.1</td>
<td>Write and evaluate numerical expressions involving whole-number bases and exponents.</td>
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<tr>
<td>6.EE.A.2</td>
<td>Apply knowledge of common mathematical terms to move between the verbal and mathematical forms of an expression with numbers and letters standing for numbers. Include expressions that arise from authentic contexts. Evaluate these variable expressions at specific values for their variables.</td>
</tr>
<tr>
<td>6.EE.A.3</td>
<td>Apply the properties of operations to generate equivalent expressions and to determine when two expressions are equivalent.</td>
</tr>
<tr>
<td>6.EE.A.4</td>
<td>[proposed merge with 6.EE.A.3 content]</td>
</tr>
</tbody>
</table>

#### 6.EE.B - Reason about and solve one-variable equations and inequalities.

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<tr>
<td>6.EE.B.5</td>
<td>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 which number(s) in a given set make an equation or inequality true.</td>
</tr>
<tr>
<td>6.EE.B.6</td>
<td>Use variables to represent numbers and write expressions when solving problems in authentic contexts.</td>
</tr>
<tr>
<td>6.EE.B.7</td>
<td>Write and solve equations of the form ( x + p = q ) and ( px = q ) in problems that arise from authentic contexts for cases in which ( p, q ) and ( x ) are all nonnegative rational numbers.</td>
</tr>
</tbody>
</table>
### 6.EE.B.8
Write inequalities of the form \( x > c \) and \( x < c \) to represent constraints or conditions to solve problems in authentic contexts. Describe and graph the infinite solutions of inequalities of the form \( x > c \) and \( x < c \).

### 6.EE.C
Represent and analyze quantitative relationships between dependent and independent variables.

#### 6.EE.C.9
Use variables to represent and analyze two quantities to solve problems in authentic contexts. Including those that change in relationship to one another; write an equation to express one quantity in terms of the other quantity.

### 6.G - Geometry


- **6.G.A.1** Find the area of triangles, quadrilaterals, and other polygons by composing into rectangles or decomposing into triangles and other shapes. Apply these techniques to solve problems in authentic contexts.
- **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. Connect and apply to the formulas \( V = l \times w \times h \) and \( V = b \times h \) to find volumes of right rectangular prisms with fractional edge lengths to solve problems in authentic contexts.
- **6.G.A.3** Draw polygons in the 4-quadrant coordinate plane given coordinates for the vertices and find the length of a side. Apply these techniques to solve problems in authentic contexts.
- **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, including those from authentic contexts.

### 6.SP - Statistics & Probability

#### 6.SP.A - Develop understanding of statistical variability.

- **6.SP.A.1** Generate and recognize statistical questions as those that anticipate variability in the data related to the question and account for it in the answers.
- **6.SP.A.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.
- **6.SP.A.3** Recognize that a measure of center for a numerical data set is a single number that summarizes all of the values in the data set, while a measure of variation is a single number that describes how the values in the data set vary from one another.
### 6.SP.B - Summarize and describe distributions.

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<tr>
<td>6.SP.B.4</td>
<td>Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</td>
</tr>
<tr>
<td>6.SP.B.5</td>
<td>Identify and describe the characteristics of numerical data sets using quantitative measures of center and variability. Additional descriptions include number of observations, measurement attributes, and shape of distribution.</td>
</tr>
</tbody>
</table>
9C: Grade 6 Crosswalk with Clarifying Guidance

CLUSTER: 6.RP.A - Understand ratio concepts and use ratio reasoning to solve problems.

**STANDARD: 6.RP.A.1**

**DRAFT Standards Statement (JAN 2021):**
Understand the concept of a ratio in authentic contexts, and use ratio language to describe a ratio relationship between two quantities.

**DRAFT Clarifying Guidance (JAN 2021):**
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.
Describe a ratio as a multiplicative relationship between two quantities.
Model a ratio relationship using a variety of representations.

**Original CCSS Text (2010):**
Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. 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."

**STANDARD: 6.RP.A.2**

**DRAFT Standards Statement (JAN 2021):**
Understand the concept of a unit rate in authentic contexts and use rate language in the context of a ratio relationship.

**DRAFT Clarifying Guidance (JAN 2021):**
For example:
This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is ¾ cup of flour for each cup of sugar.
We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger.

**Original CCSS Text (2010):**
Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. 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." (Expectations for unit rates in this grade are limited to non-complex fractions.)
STANDARD: 6.RP.A.3

DRAFT Standards Statement (JAN 2021):
Use ratio and rate reasoning to solve problems in authentic contexts that use equivalent ratios, unit rates, percents, and measurement units.

DRAFT Clarifying Guidance (JAN 2021):
Create and use a table to compare ratios and plotting the pairs of values on the coordinate plane.
Find missing values in the tables.
Use unit rates to solve problems, including problems involving unit pricing and constant speed.
Convert and manipulate measurements using given ratios.

Original CCSS Text (2010):
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.

6.RP.A.3.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.

6.RP.A.3.B Solve unit rate problems including those involving unit pricing and constant speed. 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?

6.RP.A.3.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.

6.RP.A.3.D Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
CLUSTER: 6.NS.A - Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

**STANDARD: 6.NS.A.1**

_DRAFT Standards Statement (JAN 2021):_  
Represent, interpret, and compute quotients of fractions to solve problems in authentic contexts involving division of fractions by fractions.

_DRAFT Clarifying Guidance (JAN 2021):_  
Reason and solve problems with quotients of fractions using both the measurement and partition models of division (based on what is most appropriate for the fractions in the quotient).

Describe a context for a given division problem with common fractions, including both measurement and partition contexts.

Use visual fraction models to represent and solve division problems with common fractions. For example, create a story context for \((2/3) ÷ (3/4)\) and use a visual fraction model to show the quotient.

Use equations and the relationship between multiplication and division to represent and solve a given division problem with fractions.  
For example, \((2/3) ÷ (3/4) = 8/9\) because \(3/4\) of \(8/9\) is \(2/3\). (In general, \((a/b) ÷ (c/d) = ad/bc\).)

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?

_Original CCSS Text (2010):_  
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. For example, create a story context for \((2/3) ÷ (3/4)\) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that \((2/3) ÷ (3/4) = 8/9\) because \(3/4\) of \(8/9\) is \(2/3\). (In general, \((a/b) ÷ (c/d) = ad/bc\).) 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?
CLUSTER: 6.NS.B - Compute fluently with multi-digit numbers and find common factors and multiples.

**STANDARD: 6.NS.B.2**

**DRAFT Standards Statement (JAN 2021):**
Demonstrate fluency with division of multi-digit numbers using accurate, efficient, and flexible strategies and algorithms based on place value and properties of operations.

**DRAFT Clarifying Guidance (JAN 2021):**
[no additional clarifying guidance at this time]

**Original CCSS Text (2010):**
Fluently divide multi-digit numbers using the standard algorithm.

**STANDARD: 6.NS.B.3**

**DRAFT Standards Statement (JAN 2021):**
Demonstrate fluency with addition, subtraction, multiplication, and division of positive rational numbers, including fractions and multi-digit decimals, using accurate, efficient, and flexible strategies and algorithms.

**DRAFT Clarifying Guidance (JAN 2021):**
[no additional clarifying guidance at this time]

**Original CCSS Text (2010):**
Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

**STANDARD: 6.NS.B.4**

**DRAFT Standards Statement (JAN 2021):**
Apply the greatest common factor to 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.

**DRAFT Clarifying Guidance (JAN 2021):**
For example:
Express 36 + 8 as 4 (9 + 2).

**Note:** GCF & LCM support use of distributive property.

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.

**Original CCSS Text (2010):**
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. For example, express 36 + 8 as 4 (9 + 2).
CLUSTER: 6.NS.C - Apply and extend previous understandings of numbers to the system of rational numbers.

**STANDARD: 6.NS.C.5**

DRAFT Standards Statement (JAN 2021):
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 authentic contexts, explaining the meaning of zero in each situation.

DRAFT Clarifying Guidance (JAN 2021):
For example:
- Temperature above/below zero;
- Elevation above/below sea level, Debits/credit;
- Positive/negative electric charge.

Original CCSS Text (2010):
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.
**STANDARD: 6.NS.C.6**

**DRAFT Standards Statement (JAN 2021):**
Represent 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.

**DRAFT Clarifying Guidance (JAN 2021):**

**Notes**

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.

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.

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.

**Original CCSS Text (2010):**
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.NS.C.6.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.

- **6.NS.C.6.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.

- **6.NS.C.6.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.
**STANDARD: 6.NS.C.7**

**DRAFT Standards Statement (JAN 2021):**
Understand ordering and absolute value of rational numbers. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. Write, interpret, and explain statements of order for rational numbers in authentic contexts.

**DRAFT Clarifying Guidance (JAN 2021):**

Note:
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.

Distinguish comparisons of absolute value from statements about order.

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.

Write \(-3°C > -7°C\) to express the fact that \(-3°C\) is warmer than \(-7°C\).

For an account balance of \(-30\) dollars, write \(|-30| = 30\) to describe the size of the debt in dollars.

Recognize that an account balance less than \(-30\) dollars represents a debt greater than \(30\) dollars.

**Original CCSS Text (2010):**
Understand ordering and absolute value of rational numbers.

6.NS.C.7.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.

6.NS.C.7.B Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write \(-3°C > -7°C\) to express the fact that \(-3°C\) is warmer than \(-7°C\).

6.NS.C.7.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.

6.NS.C.7.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.
**STANDARD: 6.NS.C.8**

**DRAFT Standards Statement (JAN 2021):**
Graph points in all four quadrants of the coordinate plane to solve problems in authentic contexts. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

**DRAFT Clarifying Guidance (JAN 2021):**
Understand that the slope of these lines is undefined or 0.

For example:
Rectangle RSTU has vertices at (−4,3), S(−4, −2), T(5, −2) and U(5,3). Plot the rectangle on a coordinate plane and find the perimeter of the figure.

**Original CCSS Text (2010):**
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.

**CLUSTER: 6.EE.A - Apply and extend previous understandings of arithmetic to algebraic expressions.**

**STANDARD: 6.EE.A.1**

**DRAFT Standards Statement (JAN 2021):**
Write and evaluate numerical expressions involving whole-number bases and exponents.

**DRAFT Clarifying Guidance (JAN 2021):**
Extend previous understanding by using brackets and parentheses and order of operations and exponents.

**Original CCSS Text (2010):**
Write and evaluate numerical expressions involving whole-number exponents.
**STANDARD: 6.EE.A.2**

**DRAFT Standards Statement (JAN 2021):**
Apply knowledge of common mathematical terms to move between the verbal and mathematical forms of an expression with numbers and letters standing for numbers. Include expressions that arise from authentic contexts. Evaluate these variable expressions at specific values for their variables.

**DRAFT Clarifying Guidance (JAN 2021):**

**Note:**
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.

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).

For example:
Express the calculation subtract y from 5 as 5 – y.
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.
Use the formulas V = s^3 and A = 6 s^2 to find the volume and surface area of a cube with sides of length s = 1/2.

**Original CCSS Text (2010):**
Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.A.2.A Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5 - y.

6.EE.A.2.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. 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.

6.EE.A.2.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). For example, use the formulas V = s^1 and A = 6 s^2 to find the volume and surface area of a cube with sides of length s = 1/2.
**STANDARD: 6.EE.A.3**

**DRAFT Standards Statement (JAN 2021):**
Apply the properties of operations to generate equivalent expressions and to determine when two expressions are equivalent.

**DRAFT Clarifying Guidance (JAN 2021):**
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 the expression $y + y + y$ to produce the equivalent expression $3y$ and know they are equivalent because they name the same number regardless of which number $y$ stands for.

**Original CCSS Text (2010):**
Apply the properties of operations to generate equivalent expressions. 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 $3y$.

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**STANDARD: 6.EE.A.4**

**DRAFT Standards Statement (JAN 2021):**
See Standard EE.A.3 above as we moved this standard.

**DRAFT Clarifying Guidance (JAN 2021):**
[no clarifying guidance at this time]

**Original CCSS Text (2010):**
Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number $y$ stands for.
CLUSTER: 6.EE.B - Reason about and solve one-variable equations and inequalities.

**STANDARD: 6.EE.B.5**

**DRAFT Standards Statement (JAN 2021):**
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 which number(s) in a given set make an equation or inequality true.

**DRAFT Clarifying Guidance (JAN 2021):**
Use an inequality of the form $x > c$ or $x < c$.

**Original CCSS Text (2010):**
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.

**STANDARD: 6.EE.B.6**

**DRAFT Standards Statement (JAN 2021):**
Use variables to represent numbers and write expressions when solving problems in authentic contexts.

**DRAFT Clarifying Guidance (JAN 2021):**
Understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

**Original CCSS Text (2010):**
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.

**STANDARD: 6.EE.B.7**

**DRAFT Standards Statement (JAN 2021):**
Write and solve equations of the form $x + p = q$ and $px = q$ in problems that arise from authentic contexts for cases in which $p$, $q$ and $x$ are all nonnegative rational numbers.

**DRAFT Clarifying Guidance (JAN 2021):**
Notes: $p$, $x$, and $q$ include non-whole numbers. Students should be able to solve equations of this form using strategies such as related equations, fact families, inverse operations, and visual models.

**Original CCSS Text (2010):**
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.
**STANDARD: 6.EE.B.8**

**DRAFT Standards Statement (JAN 2021):**
Write inequalities of the form $x > c$ and $x < c$ to represent constraints or conditions to solve problems in authentic contexts. Describe and graph the infinite solutions of inequalities of the form $x > c$ and $x < c$.

**DRAFT Clarifying Guidance (JAN 2021):**
Represent solutions of such inequalities on number line diagrams.

**Original CCSS Text (2010):**
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.

**CLUSTER: 6.EE.C - Represent and analyze quantitative relationships between dependent and independent variables.**

**STANDARD: 6.EE.C.9**

**DRAFT Standards Statement (JAN 2021):**
Use variables to represent and analyze two quantities to solve problems in authentic contexts. Including those that change in relationship to one another; write an equation to express one quantity in terms of the other quantity.

**DRAFT Clarifying Guidance (JAN 2021):**

**Note:**
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.

**Original CCSS Text (2010):**
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.

**STANDARD: 6.G.A.1**

DRAFT Standards Statement (JAN 2021):
Find the area of triangles, quadrilaterals, and other polygons by composing into rectangles or decomposing into triangles and other shapes. Apply these techniques to solve problems in authentic contexts.

DRAFT Clarifying Guidance (JAN 2021):
Apply these techniques in the context of solving real-world and mathematical problems.

Original CCSS Text (2010):
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.

**STANDARD: 6.G.A.2**

DRAFT Standards Statement (JAN 2021):
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. Connect and apply to the formulas V = l \cdot w \cdot h and V = b \cdot h to find volumes of right rectangular prisms with fractional edge lengths to solve problems in authentic contexts.

DRAFT Clarifying Guidance (JAN 2021):
Note:
Show that the volume is the same as would be found by multiplying the edge lengths of the prism.

Apply these techniques in the context of solving real-world and mathematical problems.

Original CCSS Text (2010):
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 \cdot w \cdot h and V = b \cdot h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
### STANDARD: 6.G.A.3

**DRAFT Standards Statement (JAN 2021):**
Draw polygons in the 4-quadrant coordinate plane given coordinates for the vertices and find the length of a side. Apply these techniques to solve problems in authentic contexts.

**DRAFT Clarifying Guidance (JAN 2021):**
Use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate.

**Original CCSS Text (2010):**
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.

### STANDARD: 6.G.A.4

**DRAFT Standards Statement (JAN 2021):**
Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures, including those from authentic contexts.

**DRAFT Clarifying Guidance (JAN 2021):**
Apply these techniques in the context of solving real-world and mathematical problems.

**Original CCSS Text (2010):**
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.
**CLUSTER: 6.SP.A. - Develop understanding of statistical variability.**

**STANDARD: 6.SP.A.1**

**DRAFT Standards Statement (JAN 2021):**
Generate and recognize statistical questions as those that anticipate variability in the data related to the question and account for it in the answers.

**DRAFT Clarifying Guidance (JAN 2021):**
Note:
Students should be able to generate their own statistical questions.
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.

*Original CCSS Text (2010):*
Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. 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.

**STANDARD: 6.SP.A.2**

**DRAFT Standards Statement (JAN 2021):**
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.

**DRAFT Clarifying Guidance (JAN 2021):**
[no additional guidance at this time]

*Original CCSS Text (2010):*
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.

**STANDARD: 6.SP.A.3**

**DRAFT Standards Statement (JAN 2021):**
Recognize that a measure of center for a numerical data set is a single number that summarizes all of the values in the data set, while a measure of variation is a single number that describes how the values in the data set vary from one another.

**DRAFT Clarifying Guidance (JAN 2021):**
[no additional guidance at this time]

*Original CCSS Text (2010):*
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.
CLUSTER: 6.SP.B. - Summarize and describe distributions.

**STANDARD: 6.SP.B.4**

DRAFT Standards Statement (JAN 2021):
Display numerical data in plots on a number line, including dot plots and histograms.

DRAFT Clarifying Guidance (JAN 2021):
[no additional guidance at this time]

Original CCSS Text (2010):
Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

**STANDARD: 6.SP.B.5**

DRAFT Standards Statement (JAN 2021):
Identify and describe the characteristics of numerical data sets using quantitative measures of center and variability. Additional descriptions include number of observations, measurement attributes, and shape of distribution.

DRAFT Clarifying Guidance (JAN 2021):
Identification and description of data characteristics related to their context includes:

- Reporting the number of observations.
- Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
- 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 were gathered.
- 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.

Original CCSS Text (2010):
Summarize numerical data sets in relation to their context, such as by:

- **6.SP.B.5.A** Reporting the number of observations.
- **6.SP.B.5.B** Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
- **6.SP.B.5.C** 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 were gathered.
- **6.SP.B.5.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.