

SIXTH GRADE MATHEMATICS

Priority Standard #1 The Number System

Apply and extend understanding of operations with rational numbers: Apply previous understanding of all four operations with rational numbers (6.NS.1-3), with the extension of dividing fractions by fractions. Students are introduced to integers via opposite signs, value, and direction; number line models; and absolute value (6.NS.5-7).

0 Not Covered

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| 1 | <ul style="list-style-type: none"> Plot negative numbers on a number line with support. Compare integers. Use inequality symbols. Divide fractions by fractions with support or with some errors. Accurately identify ordered pairs of integers in all four quadrants of a coordinate plane. |
| 2 | <ul style="list-style-type: none"> Recognize that negative numbers are the opposites of positive numbers and plot negative numbers on a number line. Compare rational numbers with minimal errors. Use inequality symbols. Accurately divide a fraction by a fraction. Accurately plot ordered pairs of integers in all four quadrants of a coordinate plane. Identify when two ordered pairs are a reflection across an axis by looking at the graph. |
| 3 | <ul style="list-style-type: none"> Understand and explain that zero is determined by a given context and understand the relationship between negative numbers, zero and positive numbers. Understand the meaning of the term opposite and plot opposites on a number line. Appropriately represent negative rational numbers as lengths from zero on a number line. Fluently compare rational numbers and integers by reasoning about their distance from zero and their relative position on the number line. Use and explain inequality symbols. Explain the meaning of the dividend, divisor, and quotient in a real-world fraction division problem. Model, understand and explain dividing a fraction by a fraction. Accurately, efficiently, and flexibly add, subtract, multiply, and divide multi-digit decimals. Accurately plot ordered pairs in all four quadrants of a coordinate plane. Recognize and describe when ordered pairs are reflections across an axis. For example, (x,y) reflected over the x-axis becomes the point $(x,-y)$. |



Priority Standard #2 Ratio and Rate Reasoning

Understand ratio concepts and apply proportional reasoning: Understand ratio concepts (6.RP.1) and understand the concept of unit rate (6.RP.2). Use multiple representations to solve ratio/rate problems (tables of equivalent ratios, equations, and plot values on a coordinate plane in all four quadrants) (6.RP.3).

0 Not Covered

- 1**
- Identify and write the parts of a ratio from a specific context.
 - Convert simple ratios multiplicatively to generate an equivalent ratio.
 - Write a ratio to show a relationship between quantities.
 - Identify a unit rate because there is a 1 as second term. (3: 1)
 - Write a number as a percent.
 - Find missing values of simple ratios.

- 2**
- Understand a ratio's meaning and write them from a specific context.
 - Read and write the different forms of ratios (2/3, 2 to 3, 2 : 3)
 - Represent and solve real world context problems using a variety of methods (such as tape diagrams, tables equivalent ratios, double number line).
 - Convert ratios multiplicatively to generate equivalent ratios with few errors.
 - Understand differences between whole-to-part, part-to-part, and part-to-whole relationships.
 - Understanding what a unit rate is and that the second term is a 1. (Miles per 1 hour)
 - Represent percent as a rate per 100 using rate reasoning.
 - Solve problems involving percentages such as finding the part, whole, or percent.
 - Represent ratios as points on coordinate grid as x & y coordinates.
 - Find missing values of ratios in a table using multiplicative reasoning.

- 3**
- Explain a ratio's meaning and how it relates to a specific context as a relationship between quantities, including the meaning of unit rates.
 - Read, write, and explain the meaning of the numbers in the different forms of ratios (2/3, 2 to 3, 2 : 3)
 - Represent, solve, and explain real world context problems using a variety of methods (such as tape diagrams, tables equivalent ratios, double number line).
 - Fluently convert ratios multiplicatively to generate equivalent ratios both larger and lower iterations that keep the same relationship between quantities. Justify reasoning.
 - Explain the differences between whole-to-part, part-to-whole, and part-to-part relationships.
 - Justify the process of discovering the missing values of ratios in a table using multiplicative reasoning.
 - Reason and explain why zero is never in the second term because ratios as division are undefined by zero.
 - Explain and represent percent as a rate per 100 using rate reasoning. (Understanding that 70 percent is 70 :100 or 70 per 100)
 - Create, use, and explain models, equations, or pictures to solve problems involving percentages such as finding the part, whole, or percent and justify their reasoning. (12 is what percent of 24?)
 - Explain and represent equivalent ratio terms as x & y coordinates on a coordinate grid.



Priority Standard #3 Simplify Expressions and Solve Simple Real-World Equations and Inequalities Involving One Variable.

Apply and extend previous understandings of arithmetic to using variables and generating equivalent algebraic expressions (6.EE.1-4). Reason about and, for the first time in their math education, formally solve simple one-variable equations and inequalities, for example: $(x+q < r)$ (6.EE.5-8).

0 Not Covered

- 1**
- Combines like terms with support.
 - Says “Four X” to describe a term such as $4x$.
 - Identify the variable in an expression, equation, and situation.
 - Calculates basic operations to find quantities when told what to do.
 - Identify whether a given expression or equation matches a given situation.
 - Understands number quantities can be compared.
 - Writes inequality statements or graph on a number line graph for an inequality.

- 2**
- Accurately combines like terms.
 - Understand the meaning of a coefficient.
 - Understand that variables are used to represent quantities.
 - Write an expression or equation given a situation.
 - Find unknown quantities by performing basic calculations.
 - Understands inequality symbols as notations for comparing quantities.
 - Write an inequality with a variable given a situation.
 - Identify when an inequality statements is notated correctly on a number line graph.

- 3**
- Fluently combine like terms and justify why only like terms can be combined.
 - Fluently solve equations with coefficients and explain the meaning of a coefficient.
 - Able to define and explain that variables are used to represent quantities.
 - Understand solving an equation or inequality as determining the value or values that make the equation or inequality true.
 - Write expressions and equations for situations and explain how an equation or expression accurately depicts a situation. Use substitution to prove if the number makes it true.
 - Explain that a variable can be an unknown number or any number in a specified set.
 - Fluently uses basic operations strategically to find quantities asked for in expressions and equations with proper order and can accurately justify their process.
 - Accurately apply the properties of operations in expressions with variables.
 - Justify variable values, write an inequality, and explain values that would make the inequality true or untrue for a specific situation, including the meaning of the 0 in the situation.
 - Accurately notate inequalities on a number line graph and explain how the number line represents the situation and inequality.



Priority Standard #4 Represent and Analyze Relationships

Represent and analyze relationships: Solve simple problems using numerical and algebraic expressions (6.EE.5-8); represent and analyze quantitative relationships between dependent and independent variables and graph the relationship on a coordinate plane (6.NS.8; 6.EE.9).

0 Not Covered

- 1**
- Write expressions and equations for situations with a single variable given a situation, with help.
 - Identify a variable in an equation.
 - Identify whether a given expression or equation matches a given situation.
 - Understand number quantities can be compared.
 - Graph given inequality statements on a number line.
 - Can use two variables in an equation without understanding why or with help.
 - Find the distance between points that do not cross an axis by counting spaces.

- 2**
- Write expressions and equations for situations with a single variable given a situation.
 - Understand that variables are used to represent quantities.
 - Write an expression or equation given a situation.
 - Find unknown quantities by performing basic calculations.
 - Understand inequality symbols as notations for comparing quantities.
 - Write an inequality with a variable given a situation.
 - Identify when an inequality statements is notated correctly on a number line graph.
 - Understand that 2 variables can be used in an equation to represent a situation.
 - Recognize a relationship between the independent and dependent variables.
 - Represent real-world or mathematical problems on a graph and use the graph to find the distance between points that have the same x or the same y-coordinate.
 - Find the length of a line segment using coordinate pairs or points on the coordinate plane.

- 3**
- Understand solving an equation or inequality as determining the value or values that make the equation or inequality true. Use substitution to prove if the number makes it true.
 - Write **expressions** and **equations** for situations with a single variable and explain how an equation or expression accurately depicts a situation.
 - Explain that a variable can be an unknown number or any number in a specified set.
 - Justify variable values, write an inequality, and explain values that would make the inequality true or untrue for a specific situation, including the meaning of the 0 in the situation.
 - Accurately notate inequalities on a number line graph and explain how the number line represents the situation and inequality.
 - Write an equation with 2 variables (independent and dependent variable) to represent two quantities in a real-world problem that change in relationship to one another and explain the relationship between the variables.
 - Analyze the relationship between the independent and dependent variables using graphs and tables. Relate this relationship to an equation with two variables.
 - Solve real-world and mathematical problems, including problems involving distance, by graphing points in all four quadrants of the coordinate plane, and explain how the points on the coordinate plane represent the problem.
 - Understand and explain how to find the length of a line segment using coordinates that have the same x or the same y-coordinate. Justify how to find the length with or without the coordinate plane.
 - Understand and justify how the distance between the point on a coordinate plane and an axis is absolute value. Apply this reasoning to finding the distance between points.

