GSD Parents' Guide for 6th Grade Utah Core State Standards for Mathematics

The Utah Core State Standards for Mathematics addresses *Standards for Mathematical Practice* and *Standards for Mathematical Content*. The standards stress not only procedural skill but also conceptual understanding, to make sure students are learning the critical information they need to succeed at higher levels.

By using the *Standards for Mathematical Practice*, students make sense of problems, persevere in solving them, and attend to precision. They look for and make use of structure and express regularity in repeated reasoning. They reason abstractly and quantitatively, and they construct viable arguments and critique the reasoning of others. Students model with mathematics and use appropriate tools strategically.

The following *Standards for Mathematical Content* define what students should understand and be able to do in their study of sixth grade mathematics:

Ratios and Proportional Relationships
- Understand ratios and use ratio language to describe relationships between two quantities.
- Understand unit rates and use rate language to describe a ratio relationship.
- Use ratio and rate reasoning to solve real world and mathematical problems.
- Make tables of equivalent ratios and plot the pairs of values on a coordinate plane. Use tables to compare ratios.
- Solve unit rate problems including unit pricing and constant speed.
- Solve problems finding the percent of a quantity and determining the whole, given a part and the percent.
- Convert measurements using ratio reasoning.

The Number System
- Divide fractions by fractions and interpret quotients in word problems.
- Fluently divide multi-digit numbers using the standard algorithm.
- Fluently add, subtract, multiply and divide multi-digit decimals using the standard algorithms.
- Find the greatest common factor of two whole numbers less than or equal to 100. Find the least common multiple of two whole numbers less than or equal to 12. Use the Distributive Property to factor out the greatest common factor from a sum of two whole numbers. *For example, express 36 + 8 as 4(9 + 2).*
- Understand that positive and negative numbers are used together to describe quantities having opposite directions or values. *For example, temperature above/below zero.* Use integers to represent real world contexts and explain the meaning of 0 in each situation.
- Recognize opposite signs of numbers indicate locations on opposite sides of 0 on a number line.
- Understand that signs of numbers in ordered pairs indicate location of a point in a quadrant of a coordinate plane. Recognize that when two ordered pairs differ only by signs, the locations of the points are reflections across one or both axes.

- Find and position integers and other rational numbers on a number line and on a coordinate plane.
- Interpret an inequality by describing the relative position of the two numbers on a number line. *For example, interpret -3 > -7 as -3 is located to the right of -7 on a horizontal number line.*
- Write, interpret, and explain statements of order for rational numbers in real world contexts.
- Understand the absolute value of a rational number as its distance from 0. Interpret absolute value of rational numbers in real world contexts.
- Solve real world and mathematical problems by graphing points in all four quadrants on a coordinate plane. Use coordinates and absolute value to find the distance between points.

Expressions and Equations
- Write and evaluate numerical expressions involving whole-number exponents.
- Write, read, and evaluate expressions in which letters stand for numbers.
- Identify parts of an expression (sum, term, product, factor, quotient, coefficient).
- Solve real world problems using substitution of number for variables in formulas and following the Order of Operations.
- Apply the properties of operations to generate and identify equivalent expressions. *For example, 3(2 + x) is equivalent to 6 + 3x and y + y + y is equivalent to 3y.*
- Determine which value(s) from a specified set make an equation or inequality true.
- Solve real world and mathematical problems by writing and solving equations in the forms $x + p = q$ and $px = q$ for nonnegative rational numbers.
- Write inequalities in the form $x > c$ and $x < c$ to represent real world and mathematical problems and graph the solutions of the inequalities on a number line.
- Represent and analyze the relationship between dependent and independent variables in a real world problem using graphs, tables, and equations.

Geometry
- Find the area of right triangles, other triangles, special quadrilaterals, and polygons in real world and mathematical problems.
- Find the volume of right rectangular prisms with fractional edge lengths. Show that the volume is the same as would be found by multiplying the edge lengths of the prism.
- Draw polygons in the coordinate plane and find the length of a side.
- Represent three-dimensional figures using nets composed of rectangles and triangles, and use the nets to find the surface area of these figures.

Statistics and Probability
- Recognize that a statistical question anticipates variability in the data.
- Understand that a set of data has a distribution that can be described by its center, spread, and overall shape.
- Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
- Summarize data by reporting the number of observations and describing the attribute being measured.
- Find measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation) of a set of data.