Maths - USA

COMMON CORE - GRADE 6

Experience Level: MIDDLE SCHOOL

Number of Classes: VARIABLE

Age Range: 10 - 11 YEARS

01 Ratios and Proportional Relationships

- Understand ratio concepts and use ratio reasoning to solve problems.
  - Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
  - Understand the concept of a unit rate a/b associated with a ratio a:b with b is not equal to 0, and use rate language in the context of a ratio relationship.
  - 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.

01 Ratios and Proportional Relationships (Contd).

- 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.
- Solve unit rate problems including those involving unit pricing and constant speed.
- Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity).
- Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

02 The Number System

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
  - 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.
- Compute fluently with multi-digit numbers and find common factors and multiples.
  - Fluently divide multi-digit numbers using the standard algorithm.
  - Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

02 The Number System (Contd).

- 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.
- Apply and extend previous understandings of numbers to the system of rational numbers.
  - Understand that positive and negative numbers are used together to describe quantities having opposite directions or values
  - Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades
    - Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line
    - Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane.
    - Find and position integers and other rational numbers on a horizontal or vertical number line diagram.
  - 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 real-world contexts.
    - Understand the absolute value of a rational number as its distance from 0 on the number line.
    - Distinguish comparisons of absolute value from statements about order.

03 Expressions and Equations

- Apply and extend previous understandings of arithmetic to algebraic expressions.
  - Write and evaluate numerical expressions involving whole-number exponents.
  - Write, read, and evaluate expressions in which letters stand for numbers.
    - Write expressions that record operations with numbers and with letters standing for numbers.
    - Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient)
    - Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems.
    - Apply the properties of operations to generate equivalent expressions.
    - Identify when two expressions are equivalent
- Reason about and solve one-variable equations and inequalities.
  - Understand solving an equation or inequality as a process of answering a question
  - Use variables to represent numbers and write expressions when solving a real-world or mathematical problem
- 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.
  - Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem.

03 Expressions and Equations (Contd.)

- Represent and analyze quantitative relationships between dependent and independent variables.
  - Use variables to represent two quantities in a real-world problem that change in relationship to one another.

04 Geometry

- Solve real-world and mathematical problems involving area, surface area, and volume.
  - Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes.
  - 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.
  - 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.
  - Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures.

05 Statistics and Probability

- Develop understanding of statistical variability.
  - Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.
  - 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.
  - 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.
- Summarize and describe distributions.
  - Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
  - Summarize numerical data sets in relation to their context, such as by:
    - 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).
    - 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.