# Fifth Grade Math Standards

Key Concept: **Number Sense and Base Ten**

The student will:

5.NSBT.1 Understand that, in a multi-digit whole number, a digit in one place represents 10 times what the same digit represents in the place to its right, and represents $\frac{1}{10}$ times what the same digit represents in the place to its left.

5.NSBT.2 Use whole number exponents to explain:
   a. patterns in the number of zeroes of the product when multiplying a number by powers of 10;
   b. patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10.

5.NSBT.3 Read and write decimals in standard and expanded form. Compare two decimal numbers to the thousandths using the symbols >, =, or <.

5.NSBT.4 Round decimals to any given place value within thousandths.

5.NSBT.5 Fluently multiply multi-digit whole numbers using strategies to include a standard algorithm.

5.NSBT.6 Divide up to a four-digit dividend by a two-digit divisor, using strategies based on place value, the properties of operations, and the relationship between multiplication and division.

5.NSBT.7 Add, subtract, multiply, and divide decimal numbers to hundredths using concrete area models and drawings.

Key Concept: **Numbers Sense and Operations – Fractions**

The student will:

5.NSF.1 Add and subtract fractions with unlike denominators (including mixed numbers) using a variety of models, including an area model and number line.

5.NSF.2 Solve real-world problems involving addition and subtraction of fractions with unlike denominators.

5.NSF.3 Understand the relationship between fractions and division of whole numbers by interpreting a fraction as the numerator divided by the denominator (i.e., $\frac{a}{b}$ = a ÷ b).

5.NSF.4 Extend the concept of multiplication to multiply a fraction or whole number by a fraction.
   a. Recognize the relationship between multiplying fractions and finding the areas of rectangles with fractional side lengths;
   b. Interpret multiplication of a fraction by a whole number and a whole number by a fraction and compute the product;
   c. Interpret multiplication in which both factors are fractions less than one and compute the product.

5.NSF.5 Justify the reasonableness of a product when multiplying with fractions.
   a. Estimate the size of the product based on the size of the two factors;
   b. Explain why multiplying a given number by a number greater than 1 (e.g., improper fractions, mixed numbers, whole numbers) results in a product larger than the given number;
   c. Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number;
   d. Explain why multiplying the numerator and denominator by the same number has the same effect as multiplying the fraction by 1.

5.NSF.6 Solve real-world problems involving multiplication of a fraction by a fraction, improper fraction and a mixed number.

5.NSF.7 Extend the concept of division to divide unit fractions and whole numbers by using visual fraction models and equations.
   a. Interpret division of a unit fraction by a non-zero whole number and compute the quotient;
   b. Interpret division of a whole number by a unit fraction and compute the quotient.

5.NSF.8 Solve real-world problems involving division of unit fractions and whole numbers, using visual fraction models and equations.

## Key Concept: **Algebraic Thinking and Operations**

The student will:

5.ATO.1 Evaluate numerical expressions involving grouping symbols (i.e., parentheses, brackets, braces).

5.ATO.2 Translate verbal phrases into numerical expressions and interpret numerical expressions as verbal phrases.

5.ATO.3 Investigate the relationship between two numerical patterns.
   a. Generate two numerical patterns given two rules and organize in tables;
   b. Translate the two numerical patterns into two sets of ordered pairs;
   c. Graph the two sets of ordered pairs on the same coordinate plane;
   d. Identify the relationship between the two numerical patterns.

## Key Concept: **Geometry**

The student will:

5.G.1 Define a coordinate system.
   a. The x- and y- axes are perpendicular number lines that intersect at 0 (the origin);
   b. Any point on the coordinate plane can be represented by its coordinates;
   c. The first number in an ordered pair is the x-coordinate and represents the horizontal distance from the origin;
   d. The second number in an ordered pair is the y-coordinate and represents the vertical distance from the origin.

5.G.2 Plot and interpret points in the first quadrant of the coordinate plane to represent real- world and mathematical situations.

5.G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

5.G.4 Classify two-dimensional figures in a hierarchy based on their attributes.

Key Concept: **Measurement and Data Analysis**

The student will:

5.MDA.1 Convert measurements within a single system of measurement: customary (i.e., in., ft., yd., oz., lb., sec., min., hr.) or metric (i.e., mm, cm, m, km, g, kg, mL, L) from a larger to a smaller unit and a smaller to a larger unit.

5.MDA.2 Create a line plot consisting of unit fractions and use operations on fractions to solve problems related to the line plot.

5.MDA.3 Understand the concept of volume measurement.
   a. Recognize volume as an attribute of right rectangular prisms;
   b. Relate volume measurement to the operations of multiplication and addition by  packing right rectangular prisms and then counting the layers of standard unit  cubes;
   c. Determine the volume of right rectangular prisms using the formula derived from  packing right rectangular prisms and counting the layers of standard unit cubes.

5.MDA.4 Differentiate among perimeter, area and volume and identify which application is appropriate for a given situation.