



BLUE VALLEY DISTRICT CURRICULUM  
**MATHEMATICS**  
Fifth Grade



In Grade 5, instructional time should focus on three critical areas: (1) developing fluency with addition and subtractions of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fraction divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

Not all of the content in a given grade is emphasized equally in the standards. Some clusters require greater emphasis than others based on the depth of ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. In addition, an intense focus on the most critical material at each grade level allows depth and learning, which is carried out through the Standards for Mathematical Practice which are:

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. (Deductive Reasoning)**
8. **Look for and express regularity in repeated reasoning. (Inductive Reasoning)**

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The standards are taught in the following sequence.

## Number and Operations In Base Ten

- Understand the place value system

- NBT.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and  $1/10$  of what it represents in the place to its left.
- NBT.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, explain patterns in the placements of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
- NBT.3 Read, write, and compare decimals to thousandths.
  - NBT.3a Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, (e.g.,  $347.382 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 8 \times (1/100) + 2 \times (1/1000)$ ).
  - NBT.3b Compare two decimals to thousandths based on meanings of the digits in each place, using  $>$ ,  $=$ ,  $<$  symbols to record the results of comparisons.
- NBT.4 Use place value understanding to round decimals to any place.

## Operations and Algebraic Thinking

- Write and Interpret numerical expressions
- Analyze patterns and relationships

- OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
- OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

## Number and Operations-Fractions

- Use equivalent fractions as a strategy to add and subtract fractions

- NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. (For example,  $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$ . In general,  $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$ ).
- NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, (e.g., by using visual fraction models or equations to represent the problem). Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

<ul style="list-style-type: none"> <li>Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</li> </ul>	<ul style="list-style-type: none"> <li>NF.3 Interpret a fraction as division of the numerator by the denominator (<math>a/b = a \div b</math>). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.</li> <li>NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or a whole number by a fraction. <ul style="list-style-type: none"> <li>NF.4a Interpret the product <math>(a/b) \times q</math> as a-parts of a partition of <math>q</math> into <math>b</math> equal parts; equivalently, as the result of a sequence of operations <math>a \times q \div b</math>.</li> <li>NF.4b Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.</li> </ul> </li> <li>NF.5 Interpret multiplication as scaling (resizing, by: <ul style="list-style-type: none"> <li>NF.5a Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.</li> <li>5.NF.5b Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence <math>a/b = (n \times a)/(n \times b)</math> to the effect of multiplying <math>a/b</math> by 1.</li> </ul> </li> <li>NF.6 Solve real world problems involving multiplication of fractions and mixed numbers</li> <li>NF.7 Apply and extend previous understandings of division to divide fractions by whole numbers and whole numbers by unit fractions. ( division of fraction by a fraction not a requirement) <ul style="list-style-type: none"> <li>NF.7a Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.</li> <li>NF.7b Interpret division of a whole number by a unit fraction, and compute such quotients.</li> <li>NF.7c Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions.</li> </ul> </li> </ul>
<p><b>Measurement and Data</b></p> <ul style="list-style-type: none"> <li>Convert like measurement units within a given measurement system.</li> </ul>	<ul style="list-style-type: none"> <li>MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.</li> </ul>

<ul style="list-style-type: none"> <li>• Represent and interpret data</li>   <li>• Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition</li> </ul>	<ul style="list-style-type: none"> <li>• MD.2 Make a line plot to display a data set of measurements in fractions of a unit (<math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{8}</math>). Use operations on fractions for this grade to solve problems involving information presented in line plots.</li>   <li>• MD.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement. <ul style="list-style-type: none"> <li>○ MD.3a A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic-unit of volume, and can be used to measure volume.</li> <li>○ MD.3b A solid figure which can be packed without gaps or overlaps using <math>n</math> unit cubes is said to have a volume of <math>n</math> cubic units.</li> </ul> </li> <li>• MD.4 Measures volumes by counting units cubes, using cubic cm, cubic in, cubic ft, and improvised units</li> <li>• MD.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. <ul style="list-style-type: none"> <li>○ MD.5a Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes.</li> <li>○ MD.5b Apply the formulas <math>V = lwh</math> and <math>V = bh</math> for rectangular prisms to find the volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.</li> <li>○ MD.5c Recognize volume as additive. Find the volumes of solid figures composed of two non-overlapping parts, applying this technique to solve real world problems.</li> </ul> </li> </ul>
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<p style="text-align: center;"><b>Geometry</b></p> <ul style="list-style-type: none"> <li>• Graph points on the coordinate plane to solve real-world and mathematical problems.</li>   <li>• Classify two-dimensional figures into categories based on their properties</li> </ul>	<ul style="list-style-type: none"> <li>• G.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersections of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond</li> <li>• G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.</li>   <li>• G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.</li> <li>• G.4 Classify two-dimensional figures in a hierarchy based on properties.</li> </ul>
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