

5th Grade Mathematics					
Mathematical Practices	Number and Operations Fractions	Numbers and Operations in Base Ten	Operations and Algebraic Thinking	Measurement and Data	Geometry
<p>Make sense of problems and persevere in solving them.</p> <p>Reason abstractly and quantitatively.</p> <p>Construct viable arguments and critique the reasoning of others.</p> <p>Model with mathematics.</p> <p>Use appropriate tools strategically.</p> <p>Attend to precision.</p> <p>Look for and make use of structure.</p> <p>Look for and express regularity in repeated</p>	<p>Use equivalent fractions as a strategy to add and subtract fractions:</p> <p>Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions using the least common multiple .</p> <p>Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.</p> <p>Use benchmark fractions and</p>	<p>Understand the place value system:</p> <p>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.</p> <p>Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or</p>	<p>Write and interpret numerical expressions:</p> <p>Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</p> <p>Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. <i>For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18932 +$</i></p>	<p>Convert like measurement units within a given measurement system:</p> <p>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.</p> <p>Geometric measurement: understand concepts of volume:</p>	<p>Graph points on the coordinate plane to solve real-world and mathematical problems:</p> <p>Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection 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</p>

<p>reasoning.</p>	<p>number sense of fractions to estimate mentally and assess the reasonableness of answers.</p> <p>Rename to subtract mixed numbers when the numerator in the minuend is smaller than the numerator in the subtrahend.</p> <p>Apply and extend previous understandings of multiplication and division:</p> <p>Interpret a fraction as division of the numerator by the denominator .</p> <p>Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers Apply and extend previous understandings of multiplication to multiply a fraction or</p>	<p>divided by a power of 10. Use whole-number exponents to denote powers of 10.</p> <p>Read, write, and compare decimals to hundred thousandths. Read and write decimals to hundred thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.</p> <p>Compare two decimals to hundred thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.</p>	<p><i>921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.</i></p> <p>Analyze patterns and relationships:</p> <p>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. <i>For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate</i></p>	<p>Recognize volume as an attribute of solid figures and understand concepts of volume measurement.</p> <p>Understand 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.</p> <p>Understand a solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.</p> <p>Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.</p> <p>Relate volume to the operations of multiplication and addition and solve</p>	<p>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 (e.g., x-axis and x-coordinate, y-axis and y-coordinate).</p> <p>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.</p> <p>Classify two-dimensional figures into</p>
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	<p>whole number or a mixed number by a fraction or a mixed number.</p> <p>Multiply fractional side lengths to find areas of rectangles.</p> <p>Interpret multiplication as scaling (resizing), by 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.</p> <p>Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relate the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.</p> <p>Solve real world problems involving</p>	<p>Use place value understanding to round decimals to any place.</p> <p>Perform operations with multi-digit whole numbers and with decimals to thousandths:</p> <p>Fluently multiply multi-digit whole numbers using the standard algorithm.</p> <p>Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by</p>	<p><i>terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.</i></p>	<p>real world and mathematical problems involving volume.</p> <p>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, e.g., to represent the associative property of multiplication.</p> <p>Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-</p>	<p>categories based on their properties:</p> <p>Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.</p> <p>Classify two-dimensional figures in a hierarchy based on properties.</p>
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	<p>multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.</p> <p>Apply and extend previous understandings of division to divide fractions, whole numbers, and mixed numbers by fractions, whole numbers, and mixed numbers using reciprocals.</p> <p>Solve real world problems involving division, e.g., by using visual fraction models and equations to represent the problem. <i>For example, how much chocolate will each person get if 3 people share $\frac{1}{2}$ lb of chocolate equally? How many $\frac{1}{3}$-cup servings are in 2 cups</i></p>	<p>using equations, rectangular arrays, and/or area models.</p> <p>Add, subtract, multiply, and divide decimals to thousandths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</p>		<p>number edge lengths in the context of solving real world and mathematical problems.</p>	
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	<p><i>of raisins?</i></p> <p>Simplify all fraction answers using the greatest common factor.</p> <p>Simplify mixed numbers that contain improper fractions.</p>				
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5th Grade Math Vocabulary:

Operations & Algebraic Thinking: equivalent, inequality, pattern, variable, expression, order of operations, evaluate, equation, forms, relationship, factoring, pair, squared, coefficient, solution, square root, inverse, vertices, exponent, point, braces, sequence, symbol, ordered pairs, rule, coordinate plane, parentheses, numerical expression, numerical pattern, brackets

Number & Operations in Base Ten: decimal number, divisible, digit, dividend, billion, operation, natural numbers, consecutive, cardinal number, calculate, sum, product, multiplicand, percent, subtrahend, estimation, million, difference, quotient, prime number

Number & Operations - Fractions: prime factorization, ordinal number, least common multiple, divisible, reduce, equivalent, remainder, divisor quotient, simplify, whole, percent, half, estimation, quarter, ratio, part, greatest common factor, fraction, dividend

Units & Coordinates: units of measure, unit conversion, coordinates, plot, unit, square unit, cubic units, y-axis, x-axis, coordinate system

Data Collection: data collection, unorganized data, arrangement, input, labels, increments, location, survey, data, organize

Measurement: Celsius, Fahrenheit, mass, quantity, scale, capacity, volume, estimate, measure, area

Problem Solving: predict, likely, probability, certainty, verify, less likely, collection, chosen, array, analysis

Interpretation: interpret, mean, ratio, bar graph, data, median, mode, line graph, circle graph, pie chart

Representation: randomly, function, stem and leaf plot, diagram, grid, scale, Venn diagram, double-bar graph, tree diagram, data

Angles: semicircle, acute angle, obtuse angle, perpendicular, degrees, congruent, right angle, straight angle, parallel lines, line

Lines: coordinates, diameter, distance, line of symmetry, intersection, side, diagonal, line segment, horizontal, vertical

Measurement: diameter, circumference, radius, horizontal, turn, translation, reflection, transformation, rotation, symmetry

Shapes: semicircle, rectangular, trapezoid, two-dimensional, tessellation, quadrilateral, symmetry, parallelogram, polygon, prism