

**BEMIDJI AREA SCHOOLS**  
**Outcomes in Mathematics – Grade 5**

Strand	Standard	No.	Benchmark
5	Number & Operation		<p>Divide multi-digit numbers, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms. Recognize that quotients can be represented in a variety of ways, including a whole number with a remainder, a fraction or mixed number, or a decimal.</p> <p><i>For example:</i> Dividing 153 by 7 can be used to convert the improper fraction <math>\frac{153}{7}</math> to the mixed number <math>21\frac{6}{7}</math>.</p>
			<p>Consider the context in which a problem is situated to select the most useful form of the quotient for the solution and use the context to interpret the quotient appropriately.</p> <p><i>For example:</i> If 77 amusement ride tickets are to be distributed evenly among 4 children, each child will receive 19 tickets, and there will be one left over. If \$77 is to be distributed evenly among 4 children, each will receive \$19.25, with nothing left over.</p>
			<p>Estimate solutions to arithmetic problems in order to assess the reasonableness of results of calculations.</p>
			<p>Solve real-world and mathematical problems requiring addition, subtraction, multiplication and division of multi-digit whole numbers. Use various strategies, including the use of a calculator and the inverse relationships between operations, to check for accuracy.</p> <p><i>For example:</i> The calculation <math>117 \div 9 = 13</math> can be checked by multiplying 9 and 13.</p>
5	Number & Operation	Read, write, represent and compare fractions and decimals; recognize and write equivalent fractions; convert between fractions and decimals; use fractions and decimals in real-world and mathematical situations.	<p>Read and write decimals using place value to describe decimals in terms of groups from millionths to millions.</p> <p><i>For example:</i> Possible names for the number 0.37 are:</p> <p style="text-align: center;">37 hundredths 3 tenths + 7 hundredths;</p> <p>possible names for the number 1.5 are:</p> <p style="text-align: center;">one and five tenths 15 tenths.</p>
			<p>Find 0.1 more than a number and 0.1 less than a number. Find 0.01 more than a number and 0.01 less than a number. Find 0.001 more than a number and 0.001 less than a number.</p>
			<p>Order fractions and decimals, including mixed numbers and improper fractions, and locate on a number line.</p> <p><i>For example:</i> Which is larger 1.25 or <math>\frac{6}{5}</math> ?</p> <p><i>Another example:</i> In order to work properly, a part must fit through a 0.24 inch wide space. If a part is <math>\frac{1}{4}</math> inch wide, will it fit?</p>
			<p>Recognize and generate equivalent decimals, fractions, mixed numbers and improper fractions in various contexts.</p> <p><i>For example:</i> When comparing 1.5 and <math>\frac{19}{12}</math>, note that <math>1.5 = 1\frac{1}{2} = 1\frac{6}{12} = \frac{18}{12}</math>, so <math>1.5 &lt; \frac{19}{12}</math>.</p>

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		5.1.2.5	Round numbers to the nearest 0.1, 0.01 and 0.001. <i>For example:</i> Fifth grade students used a calculator to find the mean of the monthly allowance in their class. The calculator display shows 25.80645161. Round this number to the nearest cent.	
	Add and subtract fractions, mixed numbers and decimals to solve real-world and mathematical problems.	5.1.3.1	Add and subtract decimals and fractions, using efficient and generalizable procedures, including standard algorithms.	
		5.1.3.2	Model addition and subtraction of fractions and decimals using a variety of representations. <i>For example:</i> Represent $\frac{2}{3} + \frac{1}{4}$ and $\frac{2}{3} - \frac{1}{4}$ by drawing a rectangle divided into 4 columns and 3 rows and shading the appropriate parts or by using fraction circles or bars.	
		5.1.3.3	Estimate sums and differences of decimals and fractions to assess the reasonableness of results in calculations. <i>For example:</i> Recognize that $12\frac{2}{5} - 3\frac{3}{4}$ is between 8 and 9 (since $\frac{2}{5} < \frac{3}{4}$ ).	
		5.1.3.4	Solve real-world and mathematical problems requiring addition and subtraction of decimals, fractions and mixed numbers, including those involving measurement, geometry and data. <i>For example:</i> Calculate the perimeter of the soccer field when the length is 109.7 meters and the width is 73.1 meters.	
5	Algebra	Recognize and represent patterns of change; use patterns, tables, graphs and rules to solve real-world and mathematical problems.	5.2.1.1	Create and use rules, tables, spreadsheets and graphs to describe patterns of change and solve problems. <i>For example:</i> An end-of-the-year party for 5th grade costs \$100 to rent the room and \$4.50 for each student. Know how to use a spreadsheet to create an input-output table that records the total cost of the party for any number of students between 90 and 150.
			5.2.1.2	Use a rule or table to represent ordered pairs of positive integers and graph these ordered pairs on a coordinate system.
		Use properties of arithmetic to generate equivalent numerical expressions and evaluate expressions involving whole numbers.	5.2.2.1	Apply the commutative, associative and distributive properties and order of operations to generate equivalent numerical expressions and to solve problems involving whole numbers. <i>For example:</i> Purchase 5 pencils at 19 cents and 7 erasers at 19 cents. The numerical expression is $5 \times 19 + 7 \times 19$ which is the same as $(5 + 7) \times 19$ .
	Understand and interpret equations and inequalities involving variables and	5.2.3.1	Determine whether an equation or inequality involving a variable is true or false for a given value of the variable. <i>For example:</i> Determine whether the inequality $1.5 + x < 10$ is true for $x = 2.8$ , $x = 8.1$ , or $x = 9.2$ .	

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	whole numbers, and use them to represent and solve real-world and mathematical problems.	5.2.3.2	Represent real-world situations using equations and inequalities involving variables. Create real-world situations corresponding to equations and inequalities. <i>For example:</i> $250 - 27 \times a = b$ can be used to represent the number of sheets of paper remaining from a packet of 250 when each student in a class of 27 is given a certain number of sheets.	
		5.2.3.3	Evaluate expressions and solve equations involving variables when values for the variables are given. <i>For example:</i> Using the formula, $A = \ell w$ , determine the area when the length is 5, and the width 6, and find the length when the area is 24 and the width is 4.	
Geometry & Measurement	Describe, classify, and draw representations of three-dimensional figures.	5.3.1.1	Describe and classify three-dimensional figures including cubes, prisms and pyramids by the number of edges, faces or vertices as well as the types of faces.	
		5.3.1.2	Recognize and draw a net for a three-dimensional figure.	
5	Geometry & Measurement	Determine the area of triangles and quadrilaterals; determine the surface area and volume of rectangular prisms in various contexts.	5.3.2.1	Develop and use formulas to determine the area of triangles, parallelograms and figures that can be decomposed into triangles.
			5.3.2.2	Determine the surface area of a rectangular prism by applying various strategies. <i>For example:</i> Use a net or decompose the surface into rectangles.
			5.3.2.3	Understand that the volume of a three-dimensional figure can be found by counting the total number of same-size cubic units that fill a shape without gaps or overlaps. Use cubic units to label volume measurements. <i>For example:</i> Use cubes to find the volume of a small fish tank.
			5.3.2.4	Develop and use the formulas $V = \ell wh$ and $V = Bh$ to determine the volume of rectangular prisms. Justify why base area $B$ and height $h$ are multiplied to find the volume of a rectangular prism by breaking the prism into layers of unit cubes.

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		5.3.2.5	<p>Use various tools to measure the volume and surface area of various objects that are shaped like rectangular prisms.</p> <p><i>For example:</i> Measure the surface area of a cereal box by cutting it into rectangles.</p> <p><i>Another example:</i> Measure the volume of a cereal box by using a ruler to measure its height, width and length, or by filling it with cereal and then emptying the cereal into containers of known volume.</p>
Data Analysis	Display and interpret data; determine mean, median and range.	5.4.1.1	<p>Know and use the definitions of the mean, median and range of a set of data. Know how to use a spreadsheet to find the mean, median and range of a data set. Understand that the mean is a "leveling out" of data.</p> <p><i>For example:</i> The set of numbers 1, 1, 4, 6 has mean 3. It can be leveled by taking one unit from the 4 and three units from the 6 and adding them to the 1s, making four 3s.</p>
		5.4.1.2	<p>Create and analyze double-bar graphs and line graphs by applying understanding of whole numbers, fractions and decimals. Know how to create spreadsheet tables and graphs to display data.</p>