

# Montana Instructional Alignment

## HPS Critical Competencies

### Mathematics

### Fourth Grade

#### Content Standards

##### **Content Standard 1 - Number Sense and Operations:**

A student, applying reasoning and problem solving, will use number sense and operations to represent numbers in multiple ways, understand relationships among numbers and number systems, make reasonable estimates and compute fluently within a variety of relevant cultural contexts.

##### **Content Standard 2 - Data Analysis:**

A student, applying reasoning and problem solving, will use data representation and analysis, probability, statistics and statistical methods to evaluate information and make informed decisions within a variety of relevant cultural contexts.

##### **Content Standard 3 - Geometric Reasoning:**

A student, applying reasoning and problem solving, will understand geometric properties and spatial relationships, transformation of shapes, representational systems, spatial reasoning and geometric models to analyze mathematical situations within a variety of relevant cultural contexts.

##### **Content Standard 4 - Algebraic and Functional Reasoning:**

A student, applying reasoning and problem solving, will use algebraic and functional concepts and procedures to understand patterns, quantitative and functional relationships, algebraic representations, models and change within a variety of relevant cultural contexts.

# Montana Instructional Alignment

## HPS Critical Competencies

### Mathematics

### Fourth Grade

**Content Standard 1 -**

**Number Sense and operations:**

A student, applying reasoning and problem solving, will use number sense and operations to represent numbers in multiple ways, understand relationships among numbers and number systems, make reasonable estimates and compute fluently within a variety of relevant cultural contexts.

**Essential Learning Expectations (ELE's / Critical Competencies) should be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.** – Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics – NCTM – National Council for Teachers of Mathematics

State Established Benchmark At the end of 4th grade, a proficient student will:	OPI Essential Learning Expectation (ELE) (HPS Critical Competencies)	NCTM	Assessment Statements (Specific Examples)	Vocabulary (for instructional purposes)										
1.1 <b>Place Value:</b> Demonstrate the relationship among whole numbers, identify place value up to 100,000 and compare numbers (i.e., greater than, less than, equal).	<ul style="list-style-type: none"> <li>Understand place value to hundred thousands.</li> </ul>	Number and Operations	<ul style="list-style-type: none"> <li><math>127,332 &gt; 101,631</math></li> </ul>	place, place value										
1.2 <b>Estimation:</b> Estimate and calculate sums, differences, and products when solving problems including cultural situations when relevant.	<ul style="list-style-type: none"> <li>Develop estimating skills for all four operations.</li> </ul>	Number and Operations	<ul style="list-style-type: none"> <li> <math display="block">\begin{array}{r} 35 \\ \times 6 \\ \hline 210 \\ + 240 \\ \hline 210 \end{array}</math> </li> </ul>	estimate, rounding										
1.3 <b>Whole Number Operations:</b> Develop multiplication and division concepts and strategies, demonstrate fluency with basic facts, and compute up to three-by two-digit whole number multiplication problems.	<ul style="list-style-type: none"> <li>Whole numbers (operations of multiplication and division)</li> <li>Solve multiplication through three-digit times two-digits.</li> <li>Multiply facts to ten fluently</li> </ul>	<b>Number and Operations</b> <ul style="list-style-type: none"> <li>Developing quick recall of multiplication facts and related division facts and fluency with whole number multiplication.</li> </ul>	<ul style="list-style-type: none"> <li> <math display="block">\begin{array}{r} 354 \\ \times 25 \\ \hline 1770 \\ + 7080 \\ \hline 8850 \end{array}</math> </li> </ul>	digit, equation										
1.4 <b>Fractions/Decimals:</b> Identify and model common fractions (i.e., tenths, quarters, halves) and decimals (e.g., money and place value to 0.001) and recognize and compare equivalent representations.	<ul style="list-style-type: none"> <li>Identify fractions (tenths, quarters, halves)</li> <li>Recognize and compare equivalent representations</li> <li>Identify and model decimals to thousandths place (.001)</li> </ul>	<b>Number and Operations</b> <ul style="list-style-type: none"> <li>Developing an understanding of decimals including, the connections between fractions and decimals.</li> </ul>	<ul style="list-style-type: none"> <li> <table style="display: inline-table; border: none;"> <tr> <td><math>\frac{1}{2}</math></td> <td><math>\frac{1}{4}</math></td> <td><math>\frac{1}{10}</math></td> <td><math>\frac{1}{100}</math></td> <td><math>\frac{1}{1000}</math></td> </tr> <tr> <td>.5</td> <td>.25</td> <td>.1</td> <td>.01</td> <td>.001</td> </tr> </table> </li> </ul>	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	.5	.25	.1	.01	.001	fraction, equivalent, tenths, hundredths, thousandths
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$										
.5	.25	.1	.01	.001										
1.5 <b>Measurement:</b> Select and apply appropriate standard units and tools to measure weight, time, and temperature.														

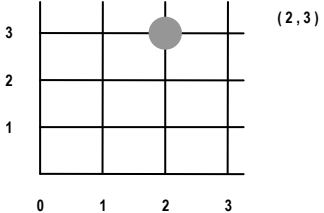
# Montana Instructional Alignment HPS Critical Competencies Mathematics Fourth Grade

**Content Standard 2 -**

**Data Analysis:**

A student, applying reasoning and problem solving, will use data representation and analysis, probability, statistics and statistical methods to evaluate information and make informed decisions within a variety of relevant cultural contexts.

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State Established Benchmark At the end of 4th grade, a proficient student will:	OPI Essential Learning Expectation (ELE) (HPS Critical Competencies)	NCTM	Assessment Statements (Specific Examples)	Vocabulary (for instructional purposes)						
2.1 <b>Represent Data:</b> Represent and organize data in tables, line plots, bar graphs, pictographs, and stem and leaf plots, tally chart.	<ul style="list-style-type: none"> <li>Interpret, read and construct tables and graphs (stem and leaf plots and line plots)</li> </ul>	<p><b>Data Analysis</b></p> <ul style="list-style-type: none"> <li>Apply an understanding of place value to develop and use stem-and-leaf plots</li> </ul>	<ul style="list-style-type: none"> <li> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">Stem</td> <td style="padding: 5px;">Leaf</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">1</td> <td style="padding: 5px; text-align: center;">0, 2, 5</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">3</td> <td style="padding: 5px; text-align: center;">6, 6, 7</td> </tr> </table> </li> </ul>	Stem	Leaf	1	0, 2, 5	3	6, 6, 7	grid, charts, tree diagram
Stem	Leaf									
1	0, 2, 5									
3	6, 6, 7									
2.2 <b>Evaluate Data:</b> Use data to solve problems ( e.g. ordering or finding range, and median when applicable).	<ul style="list-style-type: none"> <li>Solve problems from graph interpretations</li> </ul>	<p><b>Data Analysis</b></p>	<ul style="list-style-type: none"> <li>  <ul style="list-style-type: none"> <li>1, 3, 5, 5, 6 – Find the mean, median, and mode - mean = 4, mode = 5, median = 5</li> </ul> </li> </ul>	mean, median, mode, ordered pairs, maximum, minimum						
<b>Probability:</b> Describe events as likely or unlikely and discuss the degree of likelihood using words such as certain, equally likely, and impossible including cultural context when relevant.	<ul style="list-style-type: none"> <li>Describe events as likely or unlikely and discuss the degree of likelihood.</li> </ul>		<ul style="list-style-type: none"> <li>If you have 2 red, and 2 blue marbles in a bag what probability is it that you would draw a blue marble?</li> </ul>	likely, unlikely, equally likely, certain						

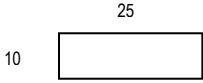
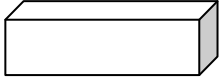
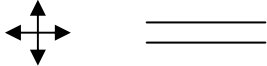
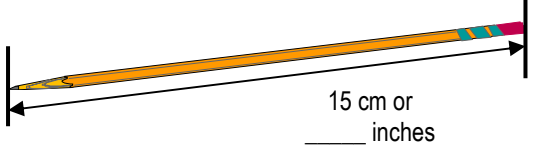
# Montana Instructional Alignment HPS Critical Competencies Mathematics Fourth Grade

**Content Standard 3 -**

**Geometric Reasoning:**

A student, applying reasoning and problem solving, will understand geometric properties and spatial relationships, transformation of shapes, representational systems, spatial reasoning and geometric models to analyze mathematical situations within a variety of relevant cultural contexts.

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State Established Benchmark At the end of 4th grade, a proficient student will:	OPI Essential Learning Expectation (ELE) (HPS Critical Competencies)	NCTM	Assessment Statements (Specific Examples)	Vocabulary (for instructional purposes)
3.1 <b>2-D Attributes:</b> Describe, compare, and analyze attributes of two-dimensional shapes.				
3.2 <b>Area &amp; Perimeter:</b> Define and determine area and perimeter of common polygons.	<ul style="list-style-type: none"> <li>Find perimeter and area of common polygons.</li> </ul>	<b>Geometry</b> <ul style="list-style-type: none"> <li>Students extend their understanding of properties of two-dimensional shapes</li> </ul>	<ul style="list-style-type: none"> <li>  </li> </ul>	area, perimeter
3.3 <b>3-D Attributes:</b> Identify attributes of three-dimensional shapes (e.g., cubes, rectangular prisms, pyramids, cylinders, cones, spheres).	<ul style="list-style-type: none"> <li>Describe, model, identify, and classify attributes of three-dimensional shapes.</li> </ul>	<b>Geometry</b>	<ul style="list-style-type: none"> <li>  </li> </ul>	
3.4 <b>Lines:</b> Recognize, draw, and represent intersecting, parallel, and perpendicular sets of lines.			<ul style="list-style-type: none"> <li>  </li> </ul>	intersecting, perpendicular, parallel
3.5 <b>Measurement:</b> Measure linear objects in metric units (e.g., centimeters and meters) and standard units (e.g., half-inch, inch, foot, and yard).	<ul style="list-style-type: none"> <li>Measure linear objects in metric and standard units (centimeter, meter, quarter-inch, half-inch, inch, foot, yard)</li> </ul>	<b>Measurement</b>	<ul style="list-style-type: none"> <li>  </li> </ul>	metric system, meter, centimeter, millimeter

# Montana Instructional Alignment HPS Critical Competencies Mathematics Fourth Grade

**Content Standard 4 -**

**Algebraic and Functional Reasoning:**

A student, applying reasoning and problem solving, will use algebraic and functional concepts and procedures to understand patterns, quantitative and functional relationships, algebraic representations, models and change within a variety of relevant cultural contexts.

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State Established Benchmark At the end of 4th grade, a proficient student will:	OPI Essential Learning Expectation (ELE) (HPS Critical Competencies)	NCTM	Assessment Statements (Specific Examples)	Vocabulary (for instructional purposes)
4.1 <b>Patterns:</b> Describe, extend, and make generalizations about patterns.	<ul style="list-style-type: none"> <li>Recognize, describe, and extend patterns</li> </ul>	Algebra	<ul style="list-style-type: none"> <li>Complete the next three ←↑↓→, _____, _____, _____, _____</li> </ul>	pattern
4.2 <b>Properties:</b> Use number patterns to investigate properties of numbers (e.g., even or odd) and operations (e.g., multiplicative/additive identities, commutative, associative, distributive).	<ul style="list-style-type: none"> <li>Use number patterns to investigate properties of numbers (i.e., even or odd) and operations (i.e., multiplicative, additive, identities, commutative, associative, distributive)</li> </ul>	Algebra	<ul style="list-style-type: none"> <li><math>2 \times 3 = 3 \times 2</math></li> <li><math>(1 \times 3) \times 2 = 1 \times (3 \times 2)</math></li> </ul>	commutative, associative
4.3 <b>Symbols:</b> Use letters, boxes, or symbols to represent numbers in simple expressions or equations (i.e., demonstrate an understanding and use of variables).	<ul style="list-style-type: none"> <li>Read, write, and solve equations using symbols and variables.</li> </ul>	Algebra	<ul style="list-style-type: none"> <li><math>&gt; &lt; =</math></li> <li><math>n \times 4 = 12</math></li> <li><math>n &lt; 25</math></li> </ul>	greater than, less than, equal to
4.4 <b>Equivalence:</b> Develop an understanding of equivalence by expressing numbers, measures, or numerical expressions in a variety of ways.	<ul style="list-style-type: none"> <li>Develop an understanding of equivalence by expressing numbers in a variety of ways.</li> </ul>	Algebra	<ul style="list-style-type: none"> <li><math>2 \times 3 = 3 \times 2</math></li> </ul>	
4.5 <b>Modeling:</b> Model problem situations with objects and use representations such as words, pictures, tables, or graphs to draw conclusions including in cultural contexts when relevant.			<ul style="list-style-type: none"> <li></li> </ul>	