

# Montana Instructional Alignment

## HPS Critical Competencies

### Mathematics

### Second 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


### Second 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 999</li> <li>Write expanded form to one thousand</li> </ul>	<b>Numbers and Operations</b> <ul style="list-style-type: none"> <li>developing an understanding of base ten numerator system and place value concepts</li> </ul>	<ul style="list-style-type: none"> <li>Given - 984 ask “what digit is in the hundreds place” “tell what place the 4 is in” etc.</li> <li>Writes 984 as: <math>900 + 80 + 4</math> <b>OR</b> writes it as: 9 hundreds, 8 tens, 4 ones</li> </ul>	
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><b>Two-digit addition and subtraction with and without regrouping</b></li> </ul>			about, almost, estimate
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>Know addition facts to 18 and apply fluently in problem solving.</li> <li>Know subtraction facts to 12 and apply fluently in problem solving.</li> <li>Add 3, 1-digit numbers to 18</li> <li>Add and subtract 2-digit number including regrouping</li> </ul>	<b>Numbers and Operations</b> <ul style="list-style-type: none"> <li>developing quick recall of addition and related subtraction facts</li> </ul>	<ul style="list-style-type: none"> <li>Solves story problems embedded with basic facts with fluency</li> <li><math>6 + 4 + 5 = \square</math></li> <li><math>26 + 32 =</math>      <math>54 - 21 =</math> <math>19 + 17 =</math>      <math>63 - 27 =</math></li> </ul>	compose numbers, counters, counting back, counting on, decompose numbers, doubles, doubles plus one, doubles minus one, equal to, fact families, number line, solve, difference, rounding, equal, sum, trading, greater than, regrouping, less than, borrow, minus, carry, not equal, plus
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 halves (1/2)</li> <li>Identify and give value of a quarter</li> <li>Count groups of coins to \$1.00</li> </ul>	<b>Geometry and Measurement</b> <ul style="list-style-type: none"> <li>spatial relationships to develop foundation for fractions</li> </ul>	<ul style="list-style-type: none"> <li>Identify half What part is shaded – </li> <li>50 – what is half of 50, 34, 110</li> <li>Show a quarter and ask for name and value</li> <li>Count various combinations of coins to \$1.00</li> </ul>	
1.5 <b>Measurement:</b> Select and apply appropriate standard units and tools to measure weight, time, and temperature.				

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**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.	<ul style="list-style-type: none"> <li>Read and interpret a variety of simple graphs.</li> <li>Collect, organize, and display data (bar, pictograph, line graph)</li> <li>Conduct simple surveys and interpret results.</li> </ul>	Data Analysis	<ul style="list-style-type: none"> <li>Successfully make symbolic simple graphs to represent collected data with concrete real objects (M&amp;M's, cubes etc.)</li> </ul>	graphs, data collection, pictograph, picture graph, survey, tally marks, rows, columns, title
2.2 <b>Evaluate Data:</b> Use data to solve problems (e.g. ordering or finding range and median when applicable).				equally, likely, less likely
2.3 <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.				predict

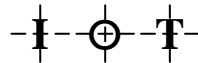
# Montana Instructional Alignment HPS Critical Competencies Mathematics Second Grade

**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.	<ul style="list-style-type: none"> <li>Sort and classify attributes of 2-dimensional shapes.</li> </ul>	<b>Geometry</b>	<ul style="list-style-type: none"> <li>Student sort 2-dimensional shapes and state sorting rule – lines, corners, faces, etc.</li> </ul>	identical, plane figures, transformation, slide, flip, turn
3.2 <b>Area &amp; Perimeter:</b> Define and determine area and perimeter of common polygons.				<b>perimeter, area</b>
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>Sort, classify, and order by common attributes</li> </ul>		<ul style="list-style-type: none"> <li>Students sort and state sorting rule using a variety of manipulatives</li> </ul>	pyramid, side, slide, solid figures
3.4 <b>Lines:</b> Recognize, draw, and represent intersecting, parallel, and perpendicular sets of lines.	<ul style="list-style-type: none"> <li>Identify vertical and horizontal lines of symmetry for 2-dimensional shapes</li> </ul>		<ul style="list-style-type: none"> <li>Identify lines of symmetry for letters or objects Example: </li> </ul>	corner, vertical, lines of symmetry, horizontal
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 accurately to the nearest inch.</li> </ul>	<b>Measurement</b> <ul style="list-style-type: none"> <li>Developing an understanding of linear measurement.</li> </ul>	<ul style="list-style-type: none"> <li>Using ruler, tape measure, yard sticks, students can measure a variety of objects commonly found in the classroom</li> </ul>	distance, centimeter, decimeter, foot, inch, meter, length, yard, width

# Montana Instructional Alignment HPS Critical Competencies Mathematics Second 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>Extend patterns</li> </ul>	<b>Algebra</b> <ul style="list-style-type: none"> <li>understanding number patterns</li> </ul>		
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>Identify odd / even numbers</li> </ul>	<b>Algebra</b> <ul style="list-style-type: none"> <li>understanding number patterns</li> </ul>		odd, even
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>Solves for missing addends to 18</li> <li>Solves for missing subtrahends to 12</li> </ul>	<b>Algebra</b> <ul style="list-style-type: none"> <li>developing an understanding of addition and subtraction</li> </ul>	<ul style="list-style-type: none"> <li><math>8 + \square = 12</math></li> <li><math>12 - \square = 8</math></li> </ul>	addend, difference, missing number
4.4 <b>Equivalence:</b> Develop an understanding of equivalence by expressing numbers, measures, or numerical expressions in a variety of ways.				
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.				