

Montana Instructional Alignment

HPS Critical Competencies

Mathematics

Third 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 Third Grade

Content Standard 1 -

Number Sense and operations:

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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 Place Value: 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"> Understand place value to ten-thousand Writes expanded form to one-thousand 	Numbers and Operations <ul style="list-style-type: none"> Developing an understanding of base 10-numerator system and place value concepts. 	<ul style="list-style-type: none"> Given 6,543, ask, "What digit is in the 10's place, what place is 6 in?" Given 6,543 Writes as: $6000 + 500 + 40 + 3$ OR writes it as: 6 thousands, 5 hundreds, 4 tens, 3 ones. Pick the greatest/least number – 3,256 3,435 3,235 $8,000 + 20 + 4$ is $<$, $>$, or $=$ to 8,422 	standard form, expanded form, digit, word form, base 10 blocks, value
1.2 Estimation: Estimate and calculate sums, differences, and products when solving problems including cultural situations when relevant.			<ul style="list-style-type: none"> Given 54, round to 50; given 55 round to 60 Given 430, round to 400; given 450 round to 500 $\\$6.55 + \\$3.95 + \\$2.25$ – Round to the nearest dollar and find the sum 	round, nearest ten, hundred, estimate, borrowing, carry, trade
1.3 Whole Number Operations: 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"> Know subtraction facts to 18 and applies fluently in problem solving. Add and subtract 3-digit numbers including regrouping. Represent (model) with manipulatives – multiplication facts and the related division facts. 	Numbers and Operations <ul style="list-style-type: none"> Developing quick recall of addition and subtraction facts. Fluency with multi-digit addition and subtraction. Developing an understanding of multiplication and division 	<ul style="list-style-type: none"> Multiplication and division facts $2 \times 3 = 6$:::: and/or  $6 \div 2 = 3$  127 x 20 	number sentence, digit, regroup, equal groups, array, factors, product

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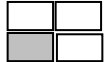


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1.4 Fractions/Decimals: Identify and model common fractions (i.e., tenths, quarters, halves) and decimals	<ul style="list-style-type: none"> Identify fourths (1/4) Identify thirds (1/3) 	Geometry and Measurement	<ul style="list-style-type: none"> Given a picture of 12 objects, identifies $\frac{1}{4}$, $\frac{1}{3}$ Shade 1/3 of figure  Shade 1/4 of figure  $\frac{1}{2}$  Show equivalent fractions $\frac{2}{4}$  	fraction, part, whole, decimal, equivalent
1.5 Measurement: Select and apply appropriate standard units and tools to measure weight, time, and temperature.	<ul style="list-style-type: none"> Use calendar to tell date Use standard and non-standard units to measure length, weight, time, and temperature. Use appropriate tools to measure time, temperature, weight, and length. 	Measurement	<ul style="list-style-type: none"> Ask, "What would you use to measure a paper clip, a book, a car?" Similar questions for weight and time Read temperature on Celsius and Fahrenheit thermometers. Tell time to quarter of an hour Elapsed time – Sarah goes to Judy's house at 3:15 p.m. and leaves to return home at 4:00 p.m. How many minutes does she play at Judy's? 	date, week, month, scale, centimeter, meter, inch, feet, yard, thermometer, degrees, ruler, gallon, quart, pint, cup, gram, kilogram, ounces, points, minute, hour, elapsed time

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Content Standard 2 -

Data Analysis:

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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 Represent Data: Represent and organize data in tables, line plots, bar graphs, pictographs, and stem and leaf plots.	<ul style="list-style-type: none"> Read and interpret a variety of graphs (More Explanation Needed here) Collect, organize, display data (bar/line graphs, pictographs, tally charts) 	<p>Data Analysis</p> <ul style="list-style-type: none"> Developing the understanding of data and graphs. 	<ul style="list-style-type: none"> Given a graph (tally chart, bar, circle, pictograph) answer questions such as “which group has more, most, total, etc.,” Uses tally chart to collect data 	bar, circle graphs, data, tally chart, pictograph, grids																																													
2.2 Evaluate Data: Use data to solve problems (e.g. ordering or finding range and median when applicable).			<ul style="list-style-type: none"> <p>④ ⑦ ⑩ - Show the median of the three given numbers</p> <p>Create a bar graph or table using student's household pets</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Pets</th> <th># of Pets</th> </tr> </thead> <tbody> <tr> <td>Dogs</td> <td></td> </tr> <tr> <td>Cats</td> <td></td> </tr> <tr> <td>Guinea Pigs</td> <td></td> </tr> <tr> <td>Fish</td> <td></td> </tr> </tbody> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th># of pets</th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>Type of pets</th> <th>Dog</th> <th>Cat</th> <th>Guinea Pig</th> <th>Fish</th> </tr> </tbody> </table> 	Pets	# of Pets	Dogs		Cats		Guinea Pigs		Fish		# of pets					4					3					2					1					0					Type of pets	Dog	Cat	Guinea Pig	Fish	median, maximum, minimum
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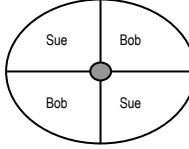
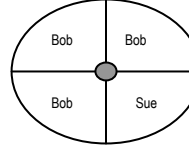
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2.3 Probability: Describe events as likely or unlikely and discuss the degree of likelihood using words such as certain, equally likely, and impossible including cultural context when relevant.	<ul style="list-style-type: none"> Probability – Using terms certain, likely, unlikely, impossible for simple events. 	Data Analysis	<ul style="list-style-type: none"> <p style="text-align: center;">Spinners cut like a pie – run fair/unfair</p> <div style="display: flex; justify-content: center; align-items: center; gap: 20px;"> <div style="text-align: center;">  <p>Fair</p> </div> <div style="text-align: center;">  <p>Unfair</p> </div> </div> Bag with coins – pennies, nickels, and dimes – Use a variety of equal and unequal combinations of coins to show likelihood of a type of coin being picked out of the bag. Bag with counters – single color or multiple colors – equal number of each color or unequal numbers of each color - References the likelihood of picking color(s) from a bag. 	certain, unlikely, impossible, equally, likely, less likely

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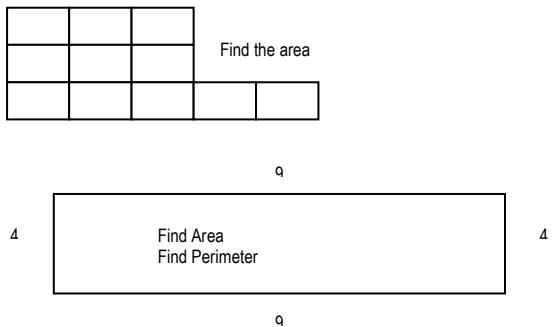
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Content Standard 3 -

Geometric Reasoning:

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3.1 2-D Attributes: Describe, compare, and analyze attributes of two-dimensional shapes.	<ul style="list-style-type: none"> Identify and classify attributes of 2-dimensional and 3-dimensional shapes. 	Geometry <ul style="list-style-type: none"> Describe and analyze properties of shapes 	<ul style="list-style-type: none"> Given 2-dimensional shapes, describe number of sides, corners, etc. 	symmetry, triangle, trapezoid, kite, rectangle, parallelogram, rhombus, attributes, pentagon, quadrilateral, plane figure area, perimeter, square, units, lines
3.2 Area & Perimeter: Define and determine area and perimeter of common polygons.			<ul style="list-style-type: none">  	
3.3 3-D Attributes: Identify attributes of three-dimensional shapes (e.g., cubes, rectangular prisms, pyramids, cylinders, cones, spheres).	<ul style="list-style-type: none"> Identify and classify attributes of 2-dimensional and 3-dimensional shapes. 		<ul style="list-style-type: none"> Given 3-dimensional shapes identify number of edges and faces Given the 3-dimensional shapes, identify and name each shape Gives examples of 3-dimensional shapes in real life. Example, soup can/cylinder Make 2 and 3-dimensional objects with faces, edges, and corners out of clay, paper, etc. 	cone, cylinder, cube, sphere, pyramid, edge, face, side
3.4 Lines: Recognize, draw, and represent intersecting, parallel, and perpendicular sets of lines.			<ul style="list-style-type: none"> Draw a point, line segment, etc. 	point, line segment, line ray, right angle, greater/less than right angles, perpendicular, parallel, perpendicular lines, intersecting lines, parallel lines

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3.5 **Measurement:** Measure linear objects in metric units (e.g., centimeters and meters) and standard units (e.g., half inch, inch, foot, and yard).

- Measure to $\frac{1}{2}$ inch
- Understand 3 feet = 1 yard

Measurement

- Give a variety of lengths in metric and standard units
- Give appropriate standard measure and metric unit for a
 - football field = ft. or yds
 - your shoe – inches
 - from here to East Helena's City Limits = miles
 - a safety pin = $\frac{1}{2}$ inch
 - a pencil to the nearest $\frac{1}{2}$ inch

meter, meter stick, centimeter, inch, inch, feet, yard

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4.1 Patterns: Describe, extend, and make generalizations about patterns.	<ul style="list-style-type: none"> Recognize, describe, extend complicated patterns 	Algebra <ul style="list-style-type: none"> Use patterns to extend knowledge of numbers and operations. 	<ul style="list-style-type: none"> Problem solving strategies, such as “make a table” 	pattern
4.2 Properties: 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"> Demonstrate commutative property 		<ul style="list-style-type: none"> Given a pattern such as 87, 97, 107, names next number in a pattern 	number family
4.3 Symbols: 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"> Read, write, and solve simple equations using symbols and variables. 	Algebra <ul style="list-style-type: none"> Developing an understanding of addition and subtraction. 	<ul style="list-style-type: none"> Uses symbols to complete statements such as $8 + 4 > 7 + 4$ 	+, -, ×, ÷, equal, =, less than, <, greater than, >, ≠
4.4 Equivalence: Develop an understanding of equivalence by expressing numbers, measures, or numerical expressions in a variety of ways.			<ul style="list-style-type: none"> $8 + 4 = \square + 7$ 	equal, missing number
4.5 Modeling: 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"> 	