

Mathematics: Essential Learning Expectations:

Seventh Grade:

Content Standard 1: Number Sense and Operation – 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, including those of Montana American Indians.

Content Standard	Essential Learning Expectations	Vocabulary	
1.1 Whole Number Relationships:	<p>A. Recall decimal and percent equivalents for common fractions.</p> <p>B. Deduce values of fraction/decimal/percent equivalencies using common fractions/decimals/percents (e.g., since $1/4=25\%$ then $3/4=75\%$).</p> <p>C. Use models to represent integers.</p> <p>D. Compare, order, and graph integers on a number line.</p> <p>E. Estimate and explain the square root of any whole number.</p>	<p>percent, integers, positive, negative, absolute value, perfect square, absolute value</p>	
1.2 Estimation and Operations:	<p>A. Use estimation strategies and judge the reasonableness of percent problems.</p> <p>B. Use a calculator to solve multi-step problems and check reasonableness with appropriate estimation strategies.</p>		
1.3 Whole Number	A. Determine if numbers	prime	

Concepts:	are prime or composite and explain the strategy used. B. Write the prime factorization of a number with and without exponents.	factorization, base, exponent, prime, composite	
1.4 Common Fractions and Decimals	A. Use and justify the strategies and procedures for computing with integers. B. Solve and create problems using integers and check the reasonableness of the answer. C. Evaluate expressions with integers and whole number exponents with and without calculator.	integers	
1.5 Length, Time, and Temperature:	A. Solve problems involving derived measures. B. Use rates to justify conversions between units within the same system. (e.g., miles per hour to feet per second) C. Use appropriate tools and technology to estimate and measure, with appropriate units, in scientific and cultural situations, including those of Montana American Indians.		
1.6 Proportional Reasoning:	A. Use proportions to solve contextual problems including scale drawings, rates, ratios, and percent problems.	proportion, discount, simple interest, tax, tips, percent increase, percent decrease, scale, scale factor	

Content Standard 2: Data Analysis Mathematics – A student, applying reasoning and problem solving, will use data representation and analysis, simulations, probability,

statistics, and statistical methods to evaluate information and make informed decisions within a variety of relevant cultural contexts, including those of Montana American Indians.

<p>2.1 Representing Data:</p>	<p>A. Organize and represent data using histograms and circle graphs. B. Organize and represent data using a scatter plot with the appropriate scale. C. Given a set of data from science, history, and culture, including those of Montana American Indians compare representative displays, and justify an appropriate selection of data representation.</p>	<p>circle graphs, histograms, quadrants</p>	
<p>2.2 Evaluating Data:</p>	<p>A. Analyze histograms and circle graphs to solve problems within daily life, scientific, and cultural contexts including those of Montana American Indians. B. Justify an appropriate selection of data representation.</p>		
<p>2.3 Likelihood of Events:</p>	<p>A. Create simple simulations and collect data to predict the theoretical probability of the event. B. Use the theoretical probability of an event to make a prediction for a large number of trials and justify your reasoning (e.g., probability of rolling a sum of two when rolling a pair of dice is 1/6; how many times would you expect a sum of two if you rolled the pair of dice 360 times).</p>	<p>conjecture, proportion, sample, complement</p>	

Content Standard 3: Geometric Reasoning – A student, applying reasoning and problem solving, will understand geometric properties, spatial relationships, and transformation of

shapes, and will use spatial reasoning and geometric models to analyze mathematical situations within a variety of relevant and cultural contexts, including those of Montana American Indians.

<p>3.1 Two-Dimensional Attributes</p>	<p>A. Decompose a cylinder into its two-dimensional shapes and compose its two-dimensional shapes into a cylinder.</p>	<p>lateral surface</p>	
<p>3.2 Three-Dimensional Attributes</p>	<p>A. Use transformations to determine similarity and/or congruence of two-dimensional and three-dimensional objects in mathematics, art, science, and culture, including Montana American Indians.</p>	<p>similar figure</p>	
<p>3.3 Basic Transformations:</p>	<p>A. Define, identify and execute a translation, a rotation, and a reflection with and without technology.</p>	<p>translation, rotation, reflection, congruent, transformation</p>	
<p>3.4 Linear Measurement:</p>	<p>A. Determine the area of circles and trapezoids and label with appropriate units. B. Determine the surface area and volume of cylinders and label with appropriate units. C. Determine the lengths, areas, and volume using proportional reasoning and scale factors of similar two- and three-dimensional objects</p>	<p>one-dimension, two-dimension, three-dimension, lateral area</p>	
<p>3.5 Area and Perimeter:</p>	<p>A. Develop and justify the area formula of a circle (e.g., decompose a circle into a number of wedges and rearrange them into a shape that approximates a parallelogram).</p>	<p>scale factor</p>	

	<p>B. Develop and justify a formula for the area of a trapezoid (e.g., decompose a trapezoid into common polygons or use a composition of two trapezoids to create another common polygon).</p> <p>C. Make a logical argument for how a scale factor affects the area and volume of similar two- and three-dimensional objects.</p>		
<p>Content Standard 4:Algebraic and Functional Reasoning – A student, applying reasoning and problem solving, will use algebraic concepts and procedures to understand processes involving number, operation, and variables and will use procedures and function concepts to model the quantitative and functional relationships that describe change within a variety of relevant cultural contexts, including those of Montana American Indians.</p>			
<p>4.1 Patterns and Relations:</p>	<p>A . Represent proportional relationships using multiple representations (tables, graphs, verbal descriptions, symbolic expressions) of data and make connections among the representations.</p>		
<p>4.2 Symbols and Expressions</p>	<p>A. Use graphs, tables, and equations to distinguish proportional relationships from other relationships, including inverse proportionality between two quantities.</p> <p>B. Distinguish between linear and non-linear functional relationships graphed with and without technology.</p>		
<p>4.3 Properties of Number and Operation</p>	<p>A. Use properties of whole numbers and inverse operations to solve one-step equations and check the</p>	<p>inequality, interval</p>	

	<p>reasonableness of the answer.</p> <p>B. Use properties of whole numbers and inverse operations to solve one-step inequalities in one variable and graph the solution on a number line.</p>		
4.4 Equivalent Expressions:	<p>A. Use properties of equality and rational numbers to rewrite an algebraic expression in multiple ways and show that the expressions are equivalent.</p>		
4.5 Numerical Modeling with Manipulatives:	<p>A. Identify the unit rate of change and justify how it relates to the slope of a line.</p>	<p>slope of a line, unit rate of change</p>	