Grade 7 Montana Standards	Novice A student who performed at this level did not meet grade-level expectations in this subject and needs considerable support to develop the required knowledge, skills, and practices necessary for future coursework in this content area. A student at this level:	Partially Proficient A student who performed at this level partially met grade-level expectations in this subject and needs support to develop the required knowledge, skills, and practices necessary for future coursework in this content area. A student at this level:	Proficient A student who performed at this level met grade-level expectations in this subject. The student has demonstrated the required knowledge, skills, and practices necessary for future coursework in this content area. A student at this level:	Advanced A student who performed at this level exceeded grade-level expectations. The student has demonstrated mastery of the required knowledge, skills, and practices necessary for future coursework in this content area. A student at this level:
Ratios and Proportional Relationship (RP)				
7.RP.A Analyze proportional relationships and use them to solve real-world and mathematical problems.				
7.RP.A.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction (1/2)/(1/4) miles per hour, equivalently 2 miles per hour.	Computes unit rates involving ratios of unit fractions to whole numbers with like or different units. Context is required. Computes unit rates involving decimals to whole numbers, other than unit pricing, with like or different units. Information should not be listed in tables, graphs, equations or diagrams. Should not use proportional language, only rate or ratio language. See 6.RP.A.2 for unit rates involving whole numbers and decimals for pricing. See 7.RP.A.2b for "constant of proportionality" language in relation to unit rate and determining unit rate from a table, graph, equation, or diagram or use of proportional language.	Computes unit rates involving ratios of unit fractions to decimals, mixed numbers or other unit fractions. Context is required. Information should not be listed in tables, graphs, equations or diagrams. Should not use proportional language, only rate or ratio language.	Computes unit rates involving non-unit fractions and/or mixed numbers. Context is required. May include unit fractions, decimals, or whole numbers as long as one value is a non-unit fraction or mixed number. Information should not be listed in tables, graphs, equations, or diagrams. Should not use proportional language, only rate or ratio language.	Determines equivalent representations of unit rates, including complex fractions, with like or different units. Information should not be listed in tables, graphs, equations, or diagrams. Should not use proportional language, only rate or ratio language.
7.RP.A.2 Recognize and represent proportional relationships between quantities.	See 7.RP.A.2a - 7.RP.A.2d.	See 7.RP.A.2a - 7.RP.A.2d.	See 7.RP.A.2a - 7.RP.A.2d.	See 7.RP.A.2a - 7.RP.A.2d.
7.RP.A.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	Determines the constant of proportionality in a proportional relationship given a table, graph or description that includes (0, 0) and consecutive equal intervals.	Determines whether quantities are in a proportional relationship given a table, graph or description that includes (0, 0) and non-consecutive intervals.	Determines whether quantities are in a proportional relationship given a table, graph or description that does not show whether (0, 0) is included. Intervals may or may not be consecutive. Determines whether a given linear equation represents a proportional relationship.	Explains/justifies why quantities are or are not in a proportional relationship given a table, graph, or description.
7.RP.A.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	Determines the constant of proportionality in a proportional relationship given a table, graph or description that includes (0, 0) and has consecutive intervals.	Determines the constant of proportionality in a proportional relationship given a table, graph or description that includes (0, 0) and has non-consecutive intervals. Determines the constant of proportionality given a linear equation that represents a proportional relationship. Distractors may include linear equations that represent non-proportional relationships.	Determines the constant of proportionality in a proportional relationship given a table, graph or description that does not include (0, 0). Intervals may or may not be consecutive.	Interprets the constant of proportionality for a given proportional relationship in the context.
7.RP.A.2c Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$. As a contemporary American Indian example, analyze cost of beading materials; cost of cooking ingredients for family gatherings, community celebrations, etc.	Identifies the equation that models a proportional relationship given in a table, graph, description, or equivalent equation.	Writes the equation that models a proportional relationship presented in a table, graph, or description where (0, 0) is included or represented.	Writes the equation that models a proportional relationship in a table, graph, or description where (0, 0) is not included in the table, represented on the graph, or included in the description.	Describes the proportional relationship between two quantities given an equation and context or generates the context from the equation.

7.RP.A.2d Explain what a point (x , y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.	Explains the meaning of coordinates of any point on the graph of a proportional relationship in terms of the context given the graph. Determines the ordered pair or the x - or y -value of a point on the graph of a proportional relationship given the x - or y -value of the coordinate. The point must be able to be read directly from the graph.	Explains the meaning of the point (0, 0) on the graph of a proportional relationship in terms of the context, with or without the graph given.	Explains the meaning of the point (1, r) on the graph of a proportional relationship in terms of the context, with or without the graph given, where r is the unit rate.	Explains the meaning of coordinates of any point on the graph of a proportional relationship in terms of the context without the graph given.
7.RP.A.3 Use proportional relationships to solve multi-step ratio and percent problems within cultural contexts, including those of Montana American Indians (e.g., percent of increase and decrease of tribal land). Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	Solves simple mathematical and real-world two-step percent problems, other than percent change, within cultural contexts, including those of Montana American Indians (e.g., A tribal nation consolidates a $10,000 loan and a $8,300 loan into a single loan with 7% simple interest. Determine the yearly interest for the loan.) See 6.RP.A.3b for one-step unit rate problems. See 6.RP.A.3d for unit conversions. See 7.G.A.1 for scale problems. See 7.G.B.4 and 7.G.B.6 for percent change problems related to geometric figures at grade 7.	Solves mathematical problems and real-world problems with three or more steps within cultural contexts, including those of Montana American Indians, involving percent change given the initial and final values.	Solves mathematical problems and real-world problems with three or more steps within cultural contexts, including those of Montana American Indians, involving percent change given the initial value and a percentage. Solves mathematical and real-world unit rate and ratio problems with three or more steps within cultural contexts, including those of Montana American Indians. Solves mathematical and real-world percent problems with three or more steps , other than percent change, within cultural contexts, including those of Montana American Indians.	Solves mathematical problems and real-world problems with three or more steps within cultural contexts, including those of Montana American Indians, involving percentage change given the final value and the percentage. Explains or justifies how to solve ratio and percentage problems in more than one way using proportional relationships (e.g., solve in two different ways or demonstrates another way to solve when given one approach).
The Number System (NS)				
7.NS.A Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.				
7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.	See 7.NS.A.1a - 7.NS.A.1d.	See 7.NS.A.1a - 7.NS.A.1d.	See 7.NS.A.1a - 7.NS.A.1d.	See 7.NS.A.1a - 7.NS.A.1d.
7.NS.A.1a Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.	Combines pairs of opposite integers to make zero when given a number line. No calculator is allowed for this standard.	Identifies a context that matches a given expression that adds to zero. No calculator is allowed for this standard.	Interpret sums of rational numbers that combine to make zero in a real-world context. No calculator is allowed for this standard.	Creates a real-world situation involving sums of rational numbers that combine to make zero. No calculator is allowed for this standard.
7.NS.A.1b Understand $p + q$ as the number located a distance $\|q\|$ from p , in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.	Adds two negative integers given a number line. Does not include opposite integers. Identifies two integers that have a sum of zero. No calculator is allowed for this standard. See 7.NS.A.1a for combining opposites given a number line. See 7.NS.A.3 for solving real-world problems. See 7.NS.A.1d for adding negative rational numbers besides integers or combining addition and subtraction of integer	Add integers of opposite signs given a number line. Adds two negative integers without a given number line. Determines the sign of the sum when adding integers. Models additive inverses of rational numbers on a number line. No calculator is allowed for this standard.	Adds integers of opposite signs without a given number line. May include more than two addends. Adds integers when at least one value is the absolute value of an integer. No calculator is allowed for this standard.	Interprets the sum of integers in a real-world context. At least one addend must be negative. Context only allowed when interpreting sums. No calculator is allowed for this standard.

7.NS.A.1c Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	Subtracts a positive integer from a negative integer given a number line. Subtracts two positive integers resulting in a negative difference given a number line. No calculator is allowed for this standard. See 7.NS.A.3 for solving real-world problems. See 7.NS.A.1d for subtracting negative rational numbers besides integers or combining addition and subtraction of integers.	Subtracts a negative integer from a positive or negative integer given a number line. Subtracts a positive integer from a negative integer without a given number line. Subtracts two positive integers resulting in a negative difference without a given number line. Determines equivalent expressions for subtraction of integers using adding the additive inverse. Identifies distance between two integers on the number line as the absolute value of the difference of two rational numbers. Determines the sign of the difference when subtracting integers. No calculator is allowed for this standard.	Subtracts a negative integer from a positive or negative integer without a given number line. Determines the distance between two integers on the number line. Subtracts integers when at least one value is the absolute value of an integer. No calculator is allowed for this standard.	Interprets the difference of integers in a real-world context, including situations involving absolute value. At least one integer must be negative. Context only allowed when interpreting differences. No calculator is allowed for this standard.
7.NS.A.1d Apply properties of operations as strategies to add and subtract rational numbers.	Adds two negative fractions or mixed numbers. No calculator is allowed for this standard. See 7.NS.A.3 for solving real-world problems. See 7.NS.A.1b and 7.NS.A.1c for stand alone addition or subtraction of integers.	Determines equivalent expressions for subtraction of rational numbers using the additive inverse. At least one value must be a non-integral rational number. Determines the sign of expressions involving the combination of adding and subtracting integers. No calculator is allowed for this standard.	Adds and subtracts three or more rational numbers. At least one value must be negative (may be the answer). At least one value must be a non-integral rational number. Terms may include absolute value. Determines the distance between two rational numbers on the number line. At least one value must be negative. At least one value must be a non-integral rational number. Determines the sign of the sum or difference when adding and/or subtracting rational numbers. Must include a non-integer number.	Evaluates claims about the sum or difference of rational numbers in a real-world context, including situations involving absolute value. Identifies examples that support or refute given claims. At least one value must be negative (may be the answer). At least one value must be a non-integral rational number. Context only allowed when interpreting differences. No calculator is allowed for this standard.
7.NS.A.1d continued.				
7.NS.A.1d continued.			No calculator is allowed for this standard.	
7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	See 7.NS.A.2a - 7.NS.A.2d.	See 7.NS.A.2a - 7.NS.A.2d.	See 7.NS.A.2a - 7.NS.A.2d.	See 7.NS.A.2a - 7.NS.A.2d.
7.NS.A.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.	Determines the sign of the product of integers based on the sign of the factors. No calculator is allowed for this standard. See 7.NS.A.2c for multiplying negative rational numbers besides integers or combining multiplication and division of integers. See 7.NS.A.3 for solving real-world problems.	Determines equivalent forms for products of two or more integers. At least one integer must be negative (e.g., -2×3 is equivalent to 2×-3 or $-(2 \times 3)$). May include whole number exponents (e.g., $-2 \times -2 \times -2$ is equivalent to $(-2)^3$ or $-(2^3)$). No calculator is allowed for this standard.	Multiplies two or more integers. At least one integer must be negative. Multiplies integers when at least one value is the absolute value of an integer. May include whole number exponents. No calculator is allowed for this standard.	Interprets the product of integers in a real-world context. At least one integer must be negative. May include whole number exponents. Context only allowed when interpreting differences. No calculator is allowed for this standard.
7.NS.A.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.	Determines the sign of the quotient of integers based on the sign of dividend and divisor. No calculator is allowed for this standard. See 7.NS.A.2c for dividing negative rational numbers besides integers or combining multiplication and division of integers. See 7.NS.A.3 for solving real-world problems.	Determines equivalent forms for quotients of integers. At least one integer must be negative. Equivalent forms may not include decimals. No calculator is allowed for this standard. See 7.NS.A.2d for fractions equivalent to decimals.	Divides integers with integral quotients. At least one integer must be negative. Divides integers when at least one value is the absolute value of an integer. No calculator is allowed for this standard.	Interprets the quotient of integers in a real-world context. At least one integer must be negative. Context only allowed when interpreting differences. No calculator is allowed for this standard.

7.NS.A.2c Apply properties of operations as strategies to multiply and divide rational numbers.	Identifies fractions with a denominator of 0 as undefined. No calculator is allowed for this standard. See 7.NS.A.2a and 7.NS.A.2b for multiplication or division of integers (other than division by zero). See 7.NS.A.3 for solving real-world problems.	Determines equivalent forms for products or quotients of two or more rational numbers. At least one value must be a non-integral rational number. Determines the sign of the value of expressions involving multiplication or division of rational numbers when at least one value is a non-integral rational number. Determines the sign of expressions involving the combination of multiplying and dividing rational numbers, including integers. May include whole number exponents. No calculator is allowed for this standard.	Multiplies and divides rational numbers. At least one value must be negative. At least one value must be a non-integral rational number. Terms may include absolute value. Evaluates expressions involving the combination of multiplying and dividing integers. Multiplies and divides rational numbers. At least one value must be negative. At least one value must be an absolute value. May include whole number exponents. No calculator is allowed for this standard.	Interprets the product or quotient of rational numbers in a real-world context. At least one value must be negative. At least one value must be a non-integral rational number. May include whole number exponents. Context only allowed when interpreting differences. No calculator is allowed for this standard.
7.NS.A.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	Converts a positive or negative unit fraction to a decimal that terminates. Must be a denominator other than 10 or 100. No calculator is allowed for this standard. See 4.NF.B.6 for translating between terminating decimals and fractions with denominators of 10 or 100. See 8.NS.A.1 for converting a repeating decimal to a fraction.	Converts a positive or negative non-unit fraction to a decimal that terminates. May use an improper fraction. Must be a denominator other than 10 or 100. No calculator is allowed for this standard.	Converts a positive or negative fraction to a repeating decimal. May use an improper fraction. Must be a denominator other than 10 or 100. No calculator is allowed for this standard.	Determines or explains patterns when converting rational numbers to decimals. Must be a denominator other than 10 or 100. No calculator is allowed for this standard.
7.NS.A.3 Solve real-world and mathematical problems from a variety of cultural contexts, including those of Montana American Indians, involving the four operations with rational numbers.	Solves one- and two-step mathematical problems involving any of the four operations with rational numbers. Must include at least one negative value. Determines expressions or equations involving integers that represent real-world and mathematical problems that involve at least one negative integer. Operations are required beyond representing the negative integer correctly. May include whole number exponents. See 6.NS.C.5 for describing real-world context using a negative number. Calculations at 7.NS.A.3 should be reasonable based on not having a calculator while still assessing the four operations. Calculations at 7.EE.A.3 should be more complex and a calculator is allowed. See 7.RP.A.3 for percentages or ratios.	Solves three-step mathematical problems involving the four operations with rational numbers. Involves combination of addition and subtraction or multiplication and division with all positive values. At least one value is not an integer. Determines expressions or equations involving rational numbers that represent real-world and mathematical problems that involve at least one negative non-integer number. Operations are required beyond representing the negative rational number correctly. Solves one-step real-world problems involving any of the four operations with rational numbers. At least one value is negative. May include whole number exponents. See 6.NS.C.5 for describing real-world context using a negative number. See 7.NS.A.1d for combining addition/subtraction of integers. See 7.NS.A.2c for combining multiplication/division of integers.	Solves mathematical problems having three or more steps involving the four operations with rational numbers. Involves combination of addition/subtraction or multiplication/division with at least one negative value. At least one value is not an integer. Solves mathematical problems having three or more steps involving the four operations with integers. Involves combination of addition/subtraction and multiplication/division. At least one value is negative. May include absolute value. Solves two-step real-world problems involving any of the four operations with rational numbers. At least one value is negative. Determines the sign of the value of expressions involving the four operations on rational numbers. Must include a combination of addition/subtraction and multiplication/division or require considering addition/subtraction and multiplication/division. May include absolute value. May include whole number exponents. See 7.NS.A.1 and 7.NS.A.2 for addition, subtraction, combining addition/subtractions, multiplication, division, or combining multiplication/division of integers.	Solves real-world problems having three or more steps involving the four operations with rational numbers. May include complex fractions. May include whole number exponents.
Expressions and Equations (EE)				
7.EE.A Use properties of operations to generate equivalent expressions.				

7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	Identifies expressions equivalent to a given expression resulting from adding, subtracting, factoring, and expanding linear expressions with positive rational coefficients. Does not require understanding operations on negative numbers. May include more than one variable with exponent of 1. See 6.EE.A.3 for applying properties of operations without operations on negative numbers or multiplying variables for commutative, associative, distributive properties and combining like terms.	Creates expressions equivalent to a given expression resulting from adding, subtracting, factoring, and expanding linear expressions with positive rational coefficients. Does not require understanding operations on negative numbers. Identifies expressions equivalent to a given expression resulting from adding, subtracting, factoring, and expanding linear expressions with integer coefficients. Requires understanding operations on negative numbers. Identifies expressions equivalent to a given linear expression with integer coefficients based on the commutative, associative, and/or distributive properties or combining like terms. Requires understanding operations on negative numbers. May include more than one variable with exponent of 1.	Creates expressions equivalent to a given expression resulting from adding, subtracting, factoring, and expanding linear expressions with integer coefficients. Requires understanding operations on negative numbers. Creates expressions equivalent to a given linear expression with integer coefficients based on the commutative, associative, and/or distributive properties or combining like terms. Requires understanding operations on negative numbers. Identifies expressions equivalent to a given expression resulting from adding, subtracting, factoring, and expanding linear expressions with rational coefficients. Requires understanding operations on negative numbers. At least one value must be a non-integral rational number. Identifies expressions equivalent to a given expression with rational coefficients based on the commutative, associative, and/or distributive properties or combining like terms. Requires understanding operations on negative numbers. At least one value must be a non-integral rational number. May include more than one variable with exponent of 1.	Creates expressions equivalent to a given expression resulting from adding, subtracting, factoring, and expanding linear expressions with rational coefficients. Requires understanding operations on negative numbers. At least one value must be a non-integral rational number. Creates expressions equivalent to a given expression with rational coefficients based on the commutative, associative, and/or distributive properties or combining like terms. Requires understanding operations on negative numbers. At least one value must be a non-integral rational number. May include more than one variable with exponent of 1.
7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."	Identifies an expression that represents a word problem.	Determines which equivalent expression to use based on a specific need in the given context.	Creates an equivalent expression to use based on a specific need in the given context.	Explains how the quantities in equivalent expressions with rational coefficients are related in terms of a given context or justifies the form used.
7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.				
7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations as strategies to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	Identifies the solution to two-step real-world or mathematical problem involving integers. May include exponents if appropriate for the context and does not require understanding properties of exponents. Uses estimation to identify the most reasonable solution to a two-step real-world or mathematical problem involving a mix of fractions, decimals, and negative numbers. Avoid items that are appropriate for a Grade 6 standard. (specifically 6.RP.A.3a-c, 6.NS.A.1, 6.NS.C.8, 6.EE.B.7, 6.G.A.1, 6.G.A.3) Problems at 7.NS.A.3 should be reasonable based on not having a calculator while still assessing the four operations. Problems at 7.EE.B.3 should be more complex and a calculator is allowed.	Solves mathematical problems with three or more steps involving rational numbers in various forms. Can include ratios and percentages as one step of many. Must include a mix of fractions, decimals, and negative numbers. May include exponents if appropriate for the context and does not require understanding properties of exponents.	Solves real-world problems with three or more steps involving rational numbers in various forms. Can include ratios and percentages as one step of many. Must include a mix of fractions, decimals, and negative numbers. May include exponents if appropriate for the context and does not require understanding properties of exponents. Determines and explains whether solutions to multi-step mathematical problems are reasonable based on the numbers and operations used.	Determines and explains whether solutions to multi-step real-world problems are reasonable based on the numbers and operations used and the context.
7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem, including those represented in Montana American Indian cultural contexts, and construct simple equations and inequalities to solve problems by reasoning about the quantities.	See 7.EE.B.4a - 7.EE.B.4b.	See 7.EE.B.4a - 7.EE.B.4b.	See 7.EE.B.4a - 7.EE.B.4b.	See 7.EE.B.4a - 7.EE.B.4b.

7.EE.B.4a Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?	Solves equations of the form $px + q = r$, $px - q = r$, $p(x + q) = r$, and p(x - q) = r where p, q, r, and x are positive rational numbers. Does not require operations on negative numbers. See 8.EE.C.7 for variables on both sides of the equal sign.	Solves equations of the form $px + q = r$, $px - q = r$, $p(x + q) = r$, and $p(x - q) = r$ where p, q, r, and x are integers. Requires operations on negative numbers to solve. Solves real-world and mathematical problems that can be solved with equations of the form $px + q = r$, $px - q = r$, $p(x + q) = r$, and $p(x - q) = r$ where p, q, r, and x are positive rational numbers. Does not require operations on negative numbers.	Solves equations of the form $px + q = r$, $px - q = r$, $p(x + q) = r$, and $p(x - q) = r$ where p, q, r, and x are rational numbers. At least one value is a non-integral rational number. Requires operations on negative numbers to solve. Solves real-world and mathematical problems that can be solved with equations of the form $px + q = r$, $px - q = r$, $p(x + q) = r$, and $p(x - q) = r$ where p, q, r, and x are integers. Requires operations on negative numbers to solve. Determines an equation in the form $px + q = r$, $px - q = r$, $p(x + q) = r$, and $p(x - q) = r$ where p, q, r, and x are rational numbers.	Solves real-world and mathematical problems that can be solved with equations of the form $px + q = r$, $px - q = r$, $p(x + q) = r$, and $p(x - q) = r$ where p, q, r, and x are rational numbers. At least one value is a non-integral rational number. Requires operations on negative numbers to solve. Explains or justifies how to solve in more than one way real world problems that can be solved with equations of the form $px + q = r$ or $p(x + q) = r$ where p, q, r, and x are rational numbers. Relates the sequence of the operations based on the approach used.
7.EE.B.4b Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example, as a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.	Solves inequalities of the form $px > r$, $px < r$, $px \geq r$, and $px \leq r$, and where p, r, and x are positive rational numbers, p does not equal 1, and graphs the solution on a number line. See 6.EE.B.8 for $x > c$, $x < c$, $x \geq c$, or $x \leq c$.	Solves inequalities of the form $px + q > r$, $px + q < r$, $px + q \geq r$, and $px + q \leq r$ where p is a positive rational number and q, r, and x are rational numbers and graphs the solution on a number line (e.g., $x - 1 < 3$; $4x + 1 > 6$). Solves inequalities of the form $px > r$, $px < r$, $px \geq r$, and $px \leq r$, where p, r, and x are rational numbers with $p < 0$ and graphs the solution on a number line.	Solves inequalities of the form $px + q > r$, $px + q < r$, $px + q \geq r$, and $px + q \leq r$ where p, q, r, and x are rational numbers with $p < 0$ and graphs the solution on a number line. Solves real world problems that can be solved with inequalities of the form $px > r$, $px < r$, $px \geq r$, $px \leq r$, $px + q > r$, $px + q < r$, $px + q \geq r$, and $px + q \leq r$ where p, q, r, and x are rational numbers. Writes inequalities of the form $px > r$, $px < r$, $px \geq r$, and $px \leq r$ to represent a real-world problem where p, r, and x are rational numbers.	Writes inequalities of the form $px + q > r$, $px + q < r$, $px + q \geq r$, and $px + q \leq r$ to represent a real-world problem where p, q, r, and x are rational numbers. Solves compound inequalities in the form $r < px < s$ and $r < x + p < s$ where p, r, s, and x are rational numbers and graphs their solutions on a number line. Includes nonstrict inequalities or a combination of strict and nonstrict inequalities.
Geometry (G)				
7.G.A Draw, construct, and describe geometrical figures and describe the relationships between them.				
7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Determines the scale factor when given corresponding lengths within a graphic and the shapes have the same orientation.	Determines the scale factor when given corresponding lengths within a graphic and the shapes have different orientations. Determines the scale factor when given corresponding lengths without a graphic. Determines missing length(s) when given the scale factor and the corresponding length(s) (with and without a graphic).	Determines the scale factor when given corresponding dimensions other than lengths (with and without a graphic). Determines missing length(s) when given at least one set of corresponding lengths (with and without a graphic). Solves problems involving perimeter of scale drawings. Creates a scale drawing using a scale other than 1.	Solves problems involving area of scale drawings. Explains why calculating area based on scale factor differs from calculating perimeter and length from scale factors. Determines, justifies, and/or compares solution methods for solving problems involving scale drawings.
7.G.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	Uses a model shown to scale to determine whether a given set of side lengths could form a triangle.	Determines whether a given set of side lengths could form a triangle when a model drawn to scale is not given.	Evaluates whether a given set of conditions determines a unique triangle, more than one triangle, or no triangle. (Conditions may include angles and sides.)	Uses tools to construct compound shapes given a set of conditions. (Classroom only)
7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	Identifies the two-dimensional figure that results from a vertical (perpendicular to the base) or horizontal (parallel to the base) cut of a right rectangular prism.	Identifies the two-dimensional figure that results from a vertical (perpendicular to the base) or horizontal (parallel to the base) cut of a right rectangular pyramid or a right prism with regular polygonal bases (other than squares).	Identifies the two-dimensional figure that results from a vertical (perpendicular to the base) or horizontal (parallel to the base) cut of a right cone or cylinder. Identifies the two-dimensional figure that results from a cut of a sphere.	Identifies the two-dimensional figure that results from a non-perpendicular/non-horizontal (angled) cut of right, rectangular prism or right rectangular pyramids.
7.G.B Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.				

7.G.B.4 Know the formulas for the area and circumference of a circle and use them to solve problems from a variety of cultural contexts, including those of Montana American Indians; give an informal derivation of the relationship between the circumference and area of a circle.	Determines the radius of a circle given the diameter and vice versa.	Determines the area of a circle given the formula and radius or diameter. Determines the circumference of a circle given the formula and the radius or diameter. Formulas are on the reference sheet.	Determines the area of a circle given the circumference. Includes real-world problems. Solves mathematical and real-world problems from a variety of cultural contexts, including those of Montana American Indians, involving the area and circumference of circles where the words "area" or "circumference" are referenced or a diagram is provided. Does not include percent change. Determines the radius, diameter, or circumference of a circle when given the area of the circle. Area must be a perfect square less than or equal to 625pi. Formulas are on the reference sheet.	Solves mathematical and real-world problems from a variety of cultural contexts, including those of Montana American Indians, involving area and circumference of circles as part of composite figures with quadrilaterals. Solves mathematical and real-world problems from a variety of cultural contexts, including those of Montana American Indians, involving the area and circumference of circles where the words "area" or "circumference" are referenced or a diagram is provided and involves percent change. Solves mathematical and real-world problems from a variety of cultural contexts, including those of Montana American Indians, involving the area and circumference of circles where students must correlate area or circumference to the real-world situation without having those terms referenced in the item and without a diagram (e.g., the distance around instead of circumference). Explains the informal derivation of the relationship between circumference and area of a circle. (Classroom only) Formulas are on the reference sheet.
7.G.B.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	Identifies adjacent, complementary, supplementary, and vertical angles based on a diagram or description without angle measures given.	Determines the missing angle measure involving vertical, adjacent, complementary, and/or supplementary angles with at least one known angle measurement given in degrees, when given a diagram. Determines the unknown angle measurement when given one angle measurement in degrees and told the unknown angle is adjacent, complementary, supplementary, or vertical, without a diagram. Determines whether two angles could be complementary, supplementary, and/or vertical angles when given two angle measurements.	Determines the value of the variable or the angle measurement of one or more angles when given angle measurements written as algebraic expressions or in terms of other angles (e.g., the measure of angle W is 20 more than the measure of angle Z) involving vertical, adjacent, complementary, and/or supplementary angles, when given a diagram. May include writing an expression or equation to represent the angle measure.	Determines the value of the variable or the angle measurement of one or more angles when given angle measurements written as algebraic expressions or in terms of other angles (e.g., the measure of angle W is 20 more than the measure of angle Z) and told another angle is adjacent, complementary, supplementary, or vertical, without a diagram. May include writing an expression or equation to represent the angle measure.
7.G.B.6 Solve real-world and mathematical problems from a variety of cultural contexts, including those of Montana American Indians, involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	Solves problems by determining perimeter and area of irregular shapes composed of triangles and rectangles when necessary dimensions are given. Solves problems by determining the volume of irregular shapes composed of rectangular prisms when the division of rectangular prisms is explicitly given. Problems may be real-world or mathematical. Formulas are on the reference sheet. See 6.G.A.1 for composing triangles and rectangles to determine area instead of using formulas. See 6.G.A.2 for volume of right rectangular prisms. See 6.G.A.4 for determining surface area using nets.	Solves problems by determining perimeter and area of irregular shapes composed of triangles and rectangles when one or more necessary dimensions is not directly given. Solves problems by determining the volume of irregular shapes composed of rectangular prisms when the division of rectangular prisms is not explicitly given. Problems may be real-world or mathematical. Formulas are on the reference sheet.	Solves problems by determining perimeter and area of composite shapes made from triangles, quadrilaterals and polygons when necessary dimensions are given and at least one of the shapes is not a triangle or a rectangle. Solves problems by determining the surface area of composite shapes made from rectangular and/or triangular prisms. Solves problems by determining the volume of composite shapes made from at least one triangular prism and another prism (either triangular or rectangular). Problems may be real-world or mathematical. Formulas are on the reference sheet.	Solves problems by determining perimeter and area of composite shapes made from triangles, quadrilaterals and polygons, including solving for a missing dimension, when one or more necessary dimensions is not directly given and at least one of the shapes is not a triangle or a rectangle. Solves problems that require determining the perimeter or area of composite shapes made from triangles, quadrilaterals, and polygons, but which require further application after determining perimeter or area (e.g., use the perimeter to then calculate the cost of placing ribbon around a figure). Solves problems that require determining the surface area or volume of shapes composed of rectangular and triangular prisms, but which require further application after determining surface area or volume. Solves problems by determining a missing dimension when given the volume of composite shapes made from rectangular and/or triangular prisms. Formulas are on the reference sheet.
Statistics and Probability (SP)				
7.SP.A Use random sampling to draw inferences about a population.				

7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	Recognizes the definitions for statistical vocabulary (population, samples, randomness). Identifies the population and the sample of a study.	Identifies a sampling method that is most likely to produce a representative sample. Distinguishes between random and non-random samples.	Determines when a sample is representative of the population. Determines whether a sample is generated by random sampling.	Analyzes the effectiveness of a given sampling method.
7.SP.A.2 Use data, including Montana American Indian demographics data, from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.	Recognizes the difference between prediction and certainty.	Identifies an appropriate inference based on given data from a random sample.	Makes an inference about a population with an unknown characteristic of interest. Selects multiple samples to produce different estimates and predictions.	Compares the estimates that can be made using different samples.
7.SP.B Draw informal comparative inferences about two populations.				
7.SP.B.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.	Draws conclusions about measures of center given representations of data in graphs for two difference populations with similar variabilities. Graphs include line/dot plots, bar graphs, histograms, and box plots. See 6.SP.B.4 for comparing different representations of the same data set.	Draws conclusions about measures of center given representations of data in tables or lists for two different populations with similar variabilities.	Draws conclusions about the measure of center for two distributions each represented in a different way.	Compares the variability of two distributions by expressing the range of each as a multiple of the mean absolute deviation from the median and/or the mean. Compares the mean absolute deviations of two distributions given that they are positive.
7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.	Draws inferences about two populations by comparing center (mean, median) and range.	Expresses the difference between centers (median, mean, mode) as a multiple of a measure of variability (interquartile range, range) given representations of data in graphs for two different populations with similar variabilities. Graphs include line/dot plots, bar graphs, histograms, and box plots. Does not include mean absolute deviation.	Expresses the difference between centers (mean, median, mode) as a multiple of a measure of variability (interquartile range, range) given representations of data in tables or lists for two different populations with similar variabilities.	Compares the relative variability of data presented on box plots. Supports inferences with arguments based on the variability of two populations presented on box plots.
7.SP.C Investigate chance processes and develop, use, and evaluate probability models.				
7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	Determines if an event is impossible, unlikely, equally likely or unlikely, more likely, or certain from a description.	Determines if a given probability represents an event that is impossible, unlikely, equally likely or unlikely, more likely, or certain. Probability may be written as a decimal, fraction, or percentage.	Determines an appropriate probability from a description of impossible, unlikely, equally likely or unlikely, more likely, or certain. Probability may be written as a decimal, fraction, or percentage.	Compares or orders probability of events from least likely to most likely (or vice versa). Explains why an event is more or less likely. Probability may be written as a decimal, fraction, or percentage.
7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times. When playing Montana American Indian hand/stick games, you can predict the approximate number of accurate guesses.	Distinguishes between relative frequency (experimental probability) and theoretical probability. Probability may be written as a decimal, fraction, or percentage.	Approximates the probability of a chance event based on collected data (relative frequency). Probability may be written as a decimal, fraction, or percentage.	Predicts relative frequency given a probability. Compares relative frequency of an event to the given probability. Probability may be written as a decimal, fraction, or percentage.	Explains the conditions under which the relative frequency approaches the given probability for a particular chance process. Probability may be written as a decimal, fraction, or percentage.

7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.	Determines the sample space for an equally likely simple event. Probability may be written as a decimal, fraction, or percentage. See 7.SP.C.6 for determining the experimental probability (relative frequency) based on data generated from a chance process.	Determines the theoretical probability of a simple event. Create a uniform probability model for a single event. Probability may be written as a decimal, fraction, or percentage.	Create a probability model for data from a chance process that is not uniform. Compares observed frequencies to a uniform probability model. Probability may be written as a decimal, fraction, or percentage.	Determines the change in conditions within a uniform probability model required to achieve a specific probability for a specific event. Analyzes/compares theoretical and experimental probability in a given chance process that is not uniform. Probability may be written as a decimal, fraction, or percentage.
7.SP.C.7a Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.	See 7.SP.C.7.	See 7.SP.C.7.	See 7.SP.C.7.	See 7.SP.C.7.
7.SP.C.7b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?	See 7.SP.C.7.	See 7.SP.C.7.	See 7.SP.C.7.	See 7.SP.C.7.
7.SP.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	See 7.SP.C.8a - 7.SP.C.8c.	See 7.SP.C.8a - 7.SP.C.8c.	See 7.SP.C.8a - 7.SP.C.8c.	See 7.SP.C.8a - 7.SP.C.8c.
7.SP.C.8a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	Determines the probability of a compound event when given a complete sample space. Probability may be written as a decimal, fraction, or percentage.	Determines the probability of a compound event that can be described using "and" by determining the number of successful outcomes divided by the total number of outcomes. Determines the probability of a compound event that can be described using "or" by determining the number of successful outcomes divided by the total number of outcomes Determines the theoretical probability of two or more independent compound events when the theoretical probability for each independent event is given. Probability may be written as a decimal, fraction, or percentage.	Determines the theoretical probability of a compound event with replacement. Determines the theoretical probability of a compound event without replacement. Probability may be written as a decimal, fraction, or percentage.	Analyzes/Explains the implications of an experiments being conducted with versus without replacement. Determines the independent or dependent events that result in a specific probability. Probability may be written as a decimal, fraction, or percentage.
7.SP.C.8b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.	Differentiates between dependent and independent events. Identifies the sample space for independent and dependent compound events. May be represented as organized lists, tables, tree diagrams, etc. Probability may be written as a decimal, fraction, or percentage.	Identifies the outcomes in a sample space which compose a compound event described in everyday language. Probability may be written as a decimal, fraction, or percentage.	Completes an organized list, a table, or a tree diagram to show the possible outcomes of an experiment. Probability may be written as a decimal, fraction, or percentage.	Identifies the entire sample space of an experiment with three events.
7.SP.C.8c Explain ways to set up a simulation and use the simulation to generate frequencies for compound events. For example, if 40% of donors have type A blood, create a simulation to predict the probability that it will take at least 4 donors to find one with type A blood.	Identifies simulations that can be used to represent a given situation involving a single event.	Calculates the experimental probability of a compound event based on the results of a given simulation. Probability may be written as a decimal, fraction, or percentage.	Identifies simulations that can be used to represent a given situation involving compound events.	Analyzes a real-world simulation used to calculate the experimental probability of a compound event.