ALASKA MATHEMATICS STANDARDS WITH LEARNING TARGETS GRADE 6

Adapted with permission from the Kentucky Department of Education, Frankfort, Kentucky 40601.

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Ratios and Proportional Relationships
Cluster	Understand ratio concepts and use ratio reasoning to solve problems.
Standard	6.RP.1
	Write and describe the relationship in real life context between two quantities using ratio language. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Write ration notation- __:__, __ to __, __/__. Know order matters when writing a ratio. Know ratios can be simplified. Know ratios compare two quantities; the quantities do not have to be the same unit of measure. Recognize that ratios appear in a variety of different contexts; part-to-whole, part-to-part, and rates.	Generalize that all ratios relate two quantities or measures within a given situation in a multiplicative relationship. Analyze your context to determine which kind of ratio is represented.		

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Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Ratios and Proportional Relationships
Cluster	Understand ratio concepts and use ratio reasoning to solve problems.
Standard	6.RP.2
	Understand the concept of a unit rate (*a/b* associated with a ratio *a:b* with *b ≠ 0*, and use rate language in the context of a ratio relationship) and apply it to solve real world problems (e.g., unit pricing, constant speed). *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Identify and calculate a unit rate. Use appropriate math terminology as related to rate.	Analyze the relationship between a ratio a:b and a unit rate a/b where b ≠ 0.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Ratios and Proportional Relationships
Cluster	Understand ratio concepts and use ratio reasoning to solve problems.
Standard	6.RP.3
	Use ratio and rate reasoning to solve real-world and mathematical problems (e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations). a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios, and understand equivalencies. b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units between given measurement systems (e.g., convert kilometers to miles); manipulate and transform units appropriately when multiplying or dividing quantities.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Make a table of equivalent ratios	Use tables to compare proportional quantities.		

using whole numbers. Find the missing values in a table of equivalent ratios. Plot pairs of values that represent equivalent ratios on the coordinate plane. Know that a percent is a ratio of a number to 100. Find a % of a number as a rate per 100.	Solve real-world and mathematical problems involving ratio and rate, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. Apply the concept of unit rate to solve real-world problems involving unit pricing. Apply the concept of unit rate to solve real-world problems involving constant speed. Solve real-world problems involving finding the whole, given a part and a percent. Apply ratio reasoning to convert measurement units in real-world and mathematical problems. Apply ratio reasoning to convert measurement units by multiplying or dividing in real-world and mathematical problems.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	The Number System
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard	6.NS.1
	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions (e.g., by using visual fraction models and equations to represent the problem); *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Compute quotients of fractions divided by fractions (including mixed numbers).	Interpret quotients of fractions Solving word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.		

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Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	The Number System
Cluster	Compute fluently with multi-digit numbers and find common factors and multiples.
Standard	6.NS.2
	Fluently multiply and divide multi-digit whole numbers using the standard algorithm. Express the remainder as a whole number, decimal, or simplified fraction; explain or justify your choice based on the context of the problem.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Fluently divide multi-digit numbers using the standard algorithm with speed and accuracy.			

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	The Number System
Cluster	Compute fluently with multi-digit numbers and find common factors and multiples.
Standard	6.NS.3
	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. Express the remainder as a terminating decimal, or a repeating decimal, or rounded to a designated place value.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation with speed and accuracy.			

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	The Number System
Cluster	Compute fluently with multi-digit numbers and find common factors and multiples.
Standard	6.NS.4
	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2).*

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Identify the factors of two whole numbers less than or equal to 100 and determine the Greatest Common Factor. Identify the multiples of two whole numbers less than or equal to 12 and determine the Least Common Multiple.	Apply the Distributive Property to rewrite addition problems by factoring out the Greatest Common Factor.		

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Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	The Number System
Cluster	Apply and extend previous understandings of numbers to the system of rational numbers.
Standard	6.NS.5
	Understand that positive and negative numbers describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explain the meaning of *0* in each situation.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Identify an integer and its Opposite.	Use integers to represent quantities in real world situations (above/below sea level, etc.). Explain where zero fits into a situation represented by Integers.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	The Number System
Cluster	Apply and extend previous understandings of numbers to the system of rational numbers.
Standard	6.NS.6
	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates; a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself [e.g., −(−3) = 3] and that 0 is its own opposite; b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes; c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Identify a rational number as a point on the number line. Identify the location of zero on a number line in relation to positive	Reason that the opposite of the opposite of a number is the number itself. Reason that when only the x value		

and negative numbers. Recognize opposite signs of numbers as locations on opposite sides of 0 on the number line. Recognize the signs of both numbers in an ordered pair indicate which quadrant of the coordinate plane the ordered pair will be located. Find and position integers and other rational numbers on a horizontal or vertical number line diagram. Find and position pairs of integers and other rational numbers on a coordinate plane.	in a set of ordered pairs are opposites, it creates a reflection over the y axis, e.g., (x,y) and (-x,y). Recognize that when only the y value in a set of ordered pairs are opposites, it creates a reflection over the x axis, e.g., (x,y) and (x, -y). Reason that when two ordered pairs differ only by signs, the locations of the points are related by reflections across both axes, e.g., (-x, -y) and (x,y).		

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Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	The Number System
Cluster	Apply and extend previous understandings of numbers to the system of rational numbers.
Standard	6.NS.7
	Understand ordering and absolute value of rational numbers; a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right*; b. Write, interpret, and explain statements of order for rational numbers in real-world contexts; *For example, write –3°C > –7°C to express the fact that –3°C is warmer than –7°C*; c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars*; d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars*.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Order rational numbers on a number line. Identify absolute value of rational	Interpret statements of inequality as statements about relative position of two numbers on a		

numbers.	number line diagram.		
	Write, interpret, and explain statements of order for rational numbers in real-world contexts.		
	Interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.		
	Distinguish comparisons of absolute value from statements about order and apply to real world contexts.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	The Number System
Cluster	Apply and extend previous understandings of numbers to the system of rational numbers.
Standard	6.NS.8
	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Calculate absolute value. Graph points in all four quadrants of the coordinate plane.	Solve real-world problems by graphing points in all four quadrants of a coordinate plane. Given only coordinates, calculate the distances between two points with the same first coordinate or the same second coordinate using absolute value.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Expressions and Equations
Cluster	Apply and extend previous understandings of arithmetic to algebraic expressions.
Standard	6.EE.1
	Write and evaluate numerical expressions involving whole-number exponents. *For example, multiply by powers of 10 and products of numbers using exponents. ($7^3 = 7 \cdot 7 \cdot 7$).*

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Write numerical expressions involving whole number exponents Ex. 34= 3x3x3x3 Evaluate numerical expressions involving whole number exponents Ex. 34= 3x3x3x3 = 81 Solve order of operation problems that contain exponents Ex. 3 + 22– (2 + 3) = 2			

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Expressions and Equations
Cluster	Apply and extend previous understandings of arithmetic to algebraic expressions.
Standard	6.EE.2
	Write, read, and evaluate expressions in which letters stand for numbers; a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y*; b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms*; c. Evaluate expressions and formulas. Include formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order with or without parentheses. (Order of Operations).

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Use numbers and variables to represent desired operations. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient,	Translating written phrases into algebraic expressions. Translating algebraic expressions into written phrases.		

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coefficient)			
Identify parts of an expression as a single entity, even if not a monomial.			
Substitute specific values for variables.			
Evaluate algebraic expressions including those that arise form real-world problems.			
Apply order of operations when there are no parentheses for expressions that include whole number exponents.			

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Expressions and Equations
Cluster	Apply and extend previous understandings of arithmetic to algebraic expressions.
Standard	6.EE.3
	Apply the properties of operations to generate equivalent expressions. Model (e.g., manipulatives, graph paper) and apply the distributive, commutative, identity, and inverse properties with integers and variables by writing equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x.*

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Generate equivalent expressions using the properties of operations. (e.g. distributive property, associative property, adding like terms with the addition property of equality, (etc.).	Apply the properties of operations to generate equivalent expressions.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Expressions and Equations
Cluster	Apply and extend previous understandings of arithmetic to algebraic expressions.
Standard	6.EE.4
	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for*.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize when two expressions are equivalent.	Prove (using various strategies) that two equations are equivalent no matter what number is substituted.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Expressions and Equations
Cluster	Reason about and solve one-variable equations and inequalities.
Standard	6.EE.5
	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true; *For example: does 5 make 3x > 7 true?*

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize solving an equation or inequality as a process of answering "which values from a specified set, if any, make the equation or inequality true?" Know that the solutions of an equation or inequality are the values that make the equation or inequality true. Use substitution to determine whether a given number in a specified set makes an equation or inequality true.			

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Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Expressions and Equations
Cluster	Reason about and solve one-variable equations and inequalities.
Standard	6.EE.6
	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	Relate variables to a context. Write expressions when solving a real-world or mathematical problem.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Expressions and Equations
Cluster	Reason about and solve one-variable equations and inequalities.
Standard	6.EE.7
	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Define inverse operation. Know how inverse operations can be used in solving one-variable equations.	Apply rules of the form $x + p = q$ and $px = q$, for cases in which p, q and x are all nonnegative rational numbers, to solve real world and mathematical problems. (There is only one unknown quantity). Develop a rule for solving one-step equations using inverse operations with nonnegative rational coefficients. Solve and write equations for real-world mathematical problems containing one unknown.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Expressions and Equations
Cluster	Reason about and solve one-variable equations and inequalities.
Standard	6.EE.8
	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Identify the constraint or condition in a real-world or mathematical problem in order to set up an inequality. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions.	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Represent solutions to inequalities or the form $x > c$ or $x < c$, with infinitely many solutions, on number line diagrams.		

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Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Expressions and Equations
Cluster	Represent and analyze quantitative relationships between dependent and independent variables.
Standard	6.EE.9
	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation; *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time*.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Define independent and dependent variables. Use variables to represent two quantities in a real-world problem that change in relationship to one another	Write an equation to express one quantity (dependent) in terms of the other quantity (independent). Analyze the relationship between the dependent variable and independent variable using tables and graphs Relate the data in a graph and table to the corresponding equation.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Geometry
Cluster	Solve real-world and mathematical problems involving area, and volume.
Standard	6.G.1
	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing or decomposing into other polygons (e.g., rectangles and triangles). Apply these techniques in the context of solving real-world and mathematical problems.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize and know how to compose and decompose polygons into triangles and rectangles.	Compare the area of a triangle to the area of the composted rectangle. Apply the techniques of composing and/or decomposing to find the area of triangles, special quadrilaterals and polygons to solve mathematical and real world problems. Discuss, develop and justify formulas for triangles and parallelograms.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Geometry
Cluster	Solve real-world and mathematical problems involving area, and volume.
Standard	6.G.2
	Apply the standard formulas to find volumes of prisms. Use the attributes and properties (including shapes of bases) of prisms to identify, compare or describe three-dimensional figures including prisms and cylinders.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Know how to calculate the volume of a right rectangular prism.	Apply volume formulas for right rectangular prisms to solve real-world and mathematical problems involving rectangular prisms with fractional edge lengths.	Model the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths.	

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Geometry
Cluster	Solve real-world and mathematical problems involving area, and volume.
Standard	6.G.3
	Draw polygons in the coordinate plane given coordinates for the vertices; determine the length of a side joining the coordinates of vertices with the same first or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Draw polygons in the coordinate plane. Use coordinates (with the same x-coordinate or the same y-coordinate) to find the length of a side of a polygon.	Apply the technique of using coordinates to find the length of a side of a polygon drawn in the coordinate plane to solve real-world and mathematical problems.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Geometry
Cluster	Solve real-world and mathematical problems involving area, and volume.
Standard	6.G.4
	Represent three-dimensional figures (e.g., prisms) using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Know that 3-D figures can be represented by nets.	Represent three-dimensional figures using nets made up of rectangles and triangles. Apply knowledge of calculating the area of rectangles and triangles to a net, and combine the areas for each shape into one answer representing the surface area of a 3-dimensional figure. Solve real-world and mathematical problems involving surface area using nets.		

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Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Geometry
Cluster	Solve real-world and mathematical problems involving area, and volume.
Standard	6.G.5
	Identify, compare or describe attributes and properties of circles (radius, and diameter). (L).

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Identify and define the properties of a circle: center, radius, diameter, circumference, area, and chord.	Compare and contrast the different properties of a circle.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Statistics and Probability
Cluster	Develop understanding of statistical variability.
Standard	6.SP.1
	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize that data can have variability. Recognize a statistical question (examples versus non-examples).			

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Statistics and Probability
Cluster	Develop understanding of statistical variability.
Standard	6.SP.2
	Understand that a set of data has a distribution that can be described by its center (mean, median, or mode), spread (range), and overall shape and can be used to answer a statistical question.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Know that a set of data has a distribution. Describe a set of data by its center, e.g., mean and median. Describe a set of data by its spread and overall shape, e.g. by identifying data clusters, peaks, gaps and symmetry.			

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Statistics and Probability
Cluster	Develop understanding of statistical variability.
Standard	6.SP.3
	Recognize that a measure of center (mean, median, or mode) for a numerical data set summarizes all of its values with a single number, while a measure of variation (range) describes how its values vary with a single number.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize there are measures of central tendency for a data set, e.g., mean, median, mode. Recognize there are measures of variances for a data set, e.g., range, interquartile range, mean absolute deviation. Recognize measures of central tendency for a data set summarizes the data with a single number. Recognize measures of variation for a data set describes how its values vary with a single number.			

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Statistics and Probability
Cluster	Summarize and describe distributions.
Standard	6.SP.4
	Display numerical data in plots on a number line, including dot or line plots, histograms and box (box and whisker) plots.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	**Reasoning**	**Skill**	**Products**
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Identify the components of dot plots, histograms, and box plots. Find the median, quartile and interquartile range of a set of data.	Analyze a set of data to determine its variance.		Create a dot plot to display a set of numerical data. Create a histogram to display a set of numerical data. Create a box plot to display a set of numerical data.

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Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Statistics and Probability
Cluster	Summarize and describe distributions.

Standard	6.SP.5.
	
	Summarize numerical data sets in relation to their context, such as by;
	  a. Reporting the number of observations (occurrences);
	  b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement;
	  c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range), as well as describing any overall pattern and any outliers with reference to the context in which the data were gathered;
	  d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Organize and display data in tables and graphs. Report the number of observations in a data set or display.	Determine the effect of outliers on quantitative measures of a set of data, e.g., mean, median, mode, range, interquartile range, mean absolute deviation.		

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Describe the data being collected, including how it was measured and its units of measurement. Calculate quantitative measures of center, e.g., mean, median, mode. Calculate quantitative measures of variance, e.g., range, interquartile range, mean absolute deviation. Identify outliers.	Choose the appropriate measure of central tendency to represent the data. Analyze the shape of the data distribution and the context in which the data were gathered to choose the appropriate measures of central tendency and variability and justify why this measure is appropriate in terms of the context.		

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Statistics and Probability
Cluster	Summarize and describe distributions.
Standard	6.SP.6
	Analyze whether a game is mathematically fair or unfair by explaining the probability of all possible outcomes. (L).

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Calculate the probability of possible outcomes. Vocabulary: Expected value, independent events, experimental probability, and theoretical probability.	Create a simulation of the game and gather data. Using the results of the simulation write a fraction that represents the results.		Create a game using dice or cards where each participant has an equal chance to win.

Alaska Mathematics Standards
Grade 6

Grade Level/Course	6
Domain	Statistics and Probability
Cluster	Summarize and describe distributions.
Standard	6.SP.7
	Solve or identify solutions to problems involving possible combinations (e.g., if ice cream sundaes come in 3 flavors with 2 possible toppings, how many different sundaes can be made using only one flavor of ice cream with one topping?) (L).

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize probabilities with multiple events. Solve probabilities with multiple vents using a several methods (formula, tree diagram).	Solve real-world problems involving probabilities involving multiple events where events are independent of each other.		Create a tree diagram to view different possible outcomes.