



## 9<sup>th</sup> Grade Correlation to Mathematics Performance Standards

	Mathematics Curriculum Framework	I CAN Learn® Lesson #	I CAN Learn® Lesson Title
	<b>NUMERATION</b>		
N-1	The student demonstrates understanding of real numbers by converting between a rational number in scientific notation and standard form (M1.4.4 & M3.4.4)	MPA-021	Converting Between Standard and Scientific Notation
		HA1-235	Applying Scientific Notation
N-2	The student demonstrates understanding of real numbers by equating different equivalent representations of the same exponential expression (e.g., $2^3 \cdot 2^5 = 2^8$ ) (M1.4.4 & M3.4.4)	HA1-810	Simplifying Expressions Using the Multiplication Properties of Exponents
N-3	The student demonstrates conceptual understanding of mathematical operations by [using models, explanations, number lines, real-life situations L] describing or illustrating the effects of arithmetic operations on real numbers (M1.4.3)	HA1-025	Comparing and Ordering Real Numbers
		HA1-030	Using Opposites and Absolute Values
		HA1-035	Adding Real Numbers Using a Number Line
		HA1-040	The Addition Rule for Real Numbers
		HA1-045	Subtracting Real Numbers
		HA1-050	Multiplying Real Numbers
		HA1-055	Dividing Real Numbers
		HA1-062	Adding, Subtracting, Multiplying, and Dividing Integers
		HA1-060	Evaluating Numerical Expressions Using the Order of Operations
N-4	The student demonstrates conceptual understanding of mathematical operations by using models, explanations, number lines, real-life situations, describing, or illustrating the use of inverse operations (squaring/square root) (M1.4.3 & 1.4.5)	HA1-035	Adding Real Numbers Using a Number Line
		HA1-079	Using a Concrete Model to Simplify Algebraic Expressions
		HA1-124	Using a Concrete Model to Solve One- and Two-Step Equations
		MPA-064	Finding Square Roots
		MPA-065	Estimating Square Roots
N-5	The student demonstrates conceptual understanding of number theory by applying the rules for order of operations to real numbers and variables (M1.3.5)	HA1-003	Order of Operations
		HA1-060	Evaluating Numerical Expressions Using the Order of Operations
		HA1-085	Simplifying Expressions Using the Properties of Real Numbers
N-6	The student demonstrates conceptual understanding of number theory by using distributive property with variables (L) (M1.4.5)	HA1-076	Basic Distributive Property
		HA1-085	Simplifying Expressions Using the Properties of Real Numbers
		HA1-079	Using a Concrete Model to Simplify Algebraic Expressions
		HA1-090	Simplifying Expressions Using the Property of -1

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		MPA-170	Solving Equations Using the Distributive Property
	<b>MEASUREMENT</b>		
MEA-1	The student demonstrates understanding of measurable attributes by estimating or converting measurements between the English and metric systems in real-world applications, given a conversion factor (e.g., miles/kilometers) (M2.4.2)	MPA-063	Converting Units Between Metric and Customary System
		MPA-155	Comparing and Converting Rates
MEA-2	The student demonstrates understanding of measurement techniques by applying indirect methods, such as the Pythagorean Theorem to find missing dimensions in real-world applications (M2.4.4)	HA1-515	Using the Pythagorean Theorem
		HA1-516	Applications of the Pythagorean Theorem
		HA1-520	Finding the Distance Between Two Points on a Coordinate Plane
		HA1-876	Applying Length, Midpoint and Slope of a Segment on a Cartesian Plane
	<b>ESTIMATION &amp; COMPUTATION</b>		
E&C-1	The student solves problems (including real-world situations) using estimation by judging whether the strategy will result in an answer greater or less than the exact answer (M3.4.1)	HA1-150	Writing an Equation to Solve Word Problems
		MPA-134	Calculating with Precision, Accuracy, and Significant Digits
		HA1-165	Using Equations to Solve Percent Problems
		HA1-170	Solving Percent of Change Problems
E&C-2	The student accurately solves problems (including real-world situations) by adding or subtracting rational numbers including integers with whole number exponents (M3.4.2)	HA1-235	Applying Scientific Notation
E&C-3	The student accurately solves problems (including real-world situations) by multiplying or dividing rational numbers including integers with whole number exponents (M3.4.3)	HA1-235	Applying Scientific Notation
		HA1-810	Simplifying Expressions Using the Multiplication Properties of Exponents
		HA1-818	Simplifying Expressions Using the Division Properties of Exponents
E&C-4	The student accurately solves problems (including real-world situations) by determining rate by using ratio and proportion (M3.4.5)	MPA-155	Comparing and Converting Rates
		HA1-160	Writing an Equation to Solve Distance, Rate, and Time Problems
		HA1-362	Solving Work Problems
E&C-5	The student accurately solves problems (including real-world situations) by multiplying or dividing numbers in scientific notation (L) (M3.4.3)	HA1-235	Applying Scientific Notation
	<b>FUNCTIONS AND RELATIONSHIPS</b>		
F&R-1	The student demonstrates conceptual understanding of functions, patterns, or sequences including those represented in real-world situations by describing or extending patterns (families of functions: linear quadratic, absolute value) up to the nth term, represented in tables, sequences, graphs, or in problem situations (M4.4.1)	HA1-402	Translating Among Multiple Representations of Functions
		HA1-442	Interpreting Graphs of Functions in Real-Life Situations
		HA1-447	Identifying Number Patterns
		HA1-448	Finding the nth Term of a Pattern
		HA1-955	Analyzing Linear Functions
		HA1-960	Real-World Applications of Linear Functions
		HA1-950	Graphing Absolute Value Functions
		HA1-887	Applications of Absolute Value, Step, and Constant Functions
		HA1-935	Analyzing Graphs of Quadratic Functions
		HA1-940	Applications of Quadratic Equations
		HA1-945	Real-World Applications of Quadratic Functions

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		HA1-927	Graphing $f(x) = ax^2$ Using Dilations
		HA1-928	Graphing $f(x) = ax^2$ Using Dilations and Reflections
		HA1-929	Graphing $f(x) = ax^2 + c$ Using Dilations, Reflections, and Vertical Translations
		HA1-820	Graphing Exponential Functions
F&R-2	The student demonstrates conceptual understanding of functions, patterns, or sequences including those represented in real-world situations by generalizing relationships (linear, quadratic, absolute value) using a table of ordered pairs, a graph, or an equation (M4.4.4)	HA1-402	Translating Among Multiple Representations of Functions
		HA1-892	Data Analysis Using the Graphing Calculator
		HA1-441	Applications of Functions and Relations Involving Distance, Rate, and Time
		HA1-442	Interpreting Graphs of Functions in Real-Life Situations
		HA1-447	Identifying Number Patterns
		HA1-448	Finding the $n$ th Term of a Pattern
		HA1-955	Analyzing Linear Functions
		HA1-960	Real-World Applications of Linear Functions
		HA1-950	Graphing Absolute Value Functions
		HA1-887	Applications of Absolute Value, Step, and Constant Functions
		HA1-935	Analyzing Graphs of Quadratic Functions
		HA1-940	Applications of Quadratic Equations
		HA1-945	Real-World Applications of Quadratic Functions
		HA1-927	Graphing $f(x) = ax^2$ Using Dilations
		HA1-928	Graphing $f(x) = ax^2$ Using Dilations and Reflections
		HA1-929	Graphing $f(x) = ax^2 + c$ Using Dilations, Reflections, and Vertical Translations
		HA1-820	Graphing Exponential Functions
F&R-3	The student demonstrates conceptual understanding of functions, patterns, or sequences including those represented in real-world situations by describing in words how a change in one variable in a formula affects the remaining variables (e.g., how changing the radius affects the volume of a cylinder) (M4.3.2)	HA1-135	Evaluating Formulas
		HA1-889	Complementary and Supplementary Angles
		HA1-890	Using Models to Derive Formulas for Two-Dimensional Geometric Figures
		HA1-891	Using Models to Derive Formulas for Three-Dimensional Solids
F&R-4	The student demonstrates conceptual understanding of functions, patterns, or sequences including those represented in real-world situations by using a calculator as a tool when describing, extending, representing, or graphing patterns or linear equations (L) (M4.4.2)	HA1-382	Solving Linear Equations Using the Graphing Calculator
		HA1-892	Data Analysis Using the Graphing Calculator
F&R-5	The student demonstrates algebraic thinking by modeling (graphically or algebraically) or solving situations (including real-world applications) using systems of linear equations (M4.4.3)	HA1-806	Solving Systems of Linear Equations Using the Graphing Calculator
		HA1-455	Solving Systems of Linear Equations by Graphing
		HA1-460	Solving Systems of Linear Equations by the Substitution Method
		HA1-465	Solving Systems of Linear Equations by the Addition/Subtraction Method
		HA1-470	Solving Systems of Linear Equations by the Multiply/Add/Subtract Method
		HA1-870	Solving Problems with Systems of Linear Equations and Inequalities
F&R-6	The student demonstrates algebraic thinking by solving or identifying solutions to multi-step linear equations of the form $ax \pm b = cx \pm d$ , where $a$ , $b$ , $c$ , and $d$ are rational numbers and $a \neq 0$ , $c \neq 0$ (M4.4.2)	HA1-144	Using a Concrete Model to Solve Equations with Variables on Both Sides
		HA1-145	Solving Equations with Variables on Both Sides
F&R-7	The student demonstrates algebraic thinking by solving literal equations or formulas for a variable involving one step (e.g., solve for $t$ when $d = rt$ )	HA1-135	Evaluating Formulas

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	(M4.4.2)		
		HA1-175	Solving Literal Equations
	<b>GEOMETRY</b>		
G-1	The student demonstrates an understanding of geometric relationships by identifying, analyzing, comparing, or using properties of angles (including supplementary or complementary) or circles (degrees in a circle) (M5.4.1)	HA1-889	Complementary and Supplementary Angles
G-2	The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by using a coordinate plane to solve problems involving congruent or similar shapes (M5.4.3)	MPA-121	Identifying Similar and Congruent Polygons Using Proportions
		MPA-180	Examining Line and Rotational Symmetry
		MPA-108	Graphing Translations and Reflections on the Coordinate Plane
G-3	The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by drawing or describing the results of applying transformations (translations, rotations, reflections, or dilations) to figures on a coordinate plane (L) (M5.4.4)	MPA-180	Examining Line and Rotational Symmetry
		MPA-108	Graphing Translations and Reflections on the Coordinate Plane
G-4	The student solves problems (including real-world situations) by determining the volume or surface area of prisms, cylinders, cones or pyramids (M5.3.4)	MPA-115	Finding the Volumes of Prisms, Cylinders, Pyramids, and Cones Using Models
		HA1-890	Using Models to Derive Formulas for Two-Dimensional Geometric Figures
		HA1-891	Using Models to Derive Formulas for Three-Dimensional Solids
G-5	The student demonstrates understanding of position and direction when solving problems (including real-world situations) by graphing or identifying (using equations or formulas to determine the slope of line segments) on a coordinate plane (M5.4.5)	MPA-135	Determining the Slope of a Line
		HA1-380	Graphing Linear Equations
		HA1-385	Finding the Slope of a Line from its Graph or from the Coordinates of Two Points
		HA1-398	Graphing Linear Equations Using Slope and y-Intercept or Slope and a Point
**G-6	The student demonstrates a conceptual understanding of geometric drawings or constructions by drawing, measuring, or constructing geometric models of plane figures (containing parallel and/or perpendicular lines) (L) (M5.4.6)	MPA-105	Determining the Measure of Angles Made by Parallel Lines and a Transversal
		HA1-866	Drawing a Line Using Slope-Intercept Form and Determining if Two Lines are Parallel or Perpendicular
	<b>STATISTICS AND PROBABILITY</b>		
S&P-1	The student demonstrates an ability to classify and organize data by [designing, collecting L], organizing, displaying, or explaining the classification of data in real-world problems (e.g., science or humanities, peers, community, or careers) using information from tables or graphs that display two sets of data [or with technology L] (M6.4.1)	HA1-892	Data Analysis Using the Graphing Calculator
S&P-2	The student demonstrates an ability to analyze data (comparing, explaining, interpreting, evaluating, making predictions, describing trends; drawing, formulating, or justifying conclusions) by using information from a variety of displays or analyzing the validity of statistical conclusions found in the media (M6.4.1)	HA1-877	Drawing Inferences and Making Predictions from Tables and Graphs
S&P-3	The student demonstrates an ability to analyze data (comparing, explaining, interpreting, evaluating, making predictions, describing trends; drawing, formulating, or justifying conclusions) by using range and measures of central tendency to determine the best representation of the data for a practical situation (M6.4.3)	HA1-545	Making a Frequency Distribution Table

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		HA1-540	Finding the Mean, Median, and Mode from Data and Frequency Distribution Tables
		HA1-541	Analyzing Data Using the Measures of Central Tendency and the Range
S&P-4	The student demonstrates an ability to analyze data (comparing, explaining, interpreting, evaluating, making predictions, describing trends; drawing, formulating, or justifying conclusions) by identifying and/or showing the meaning of a best fit line (M6.4.2)	HA1-965	Determining the Best-Fitting Line
		MPA-132	Interpreting and Creating Scatterplots
S&P-5	The student demonstrates a conceptual understanding of probability and counting techniques by determining or comparing the experimental and/or theoretical probability of independent or dependent events (M6.4.5)	HA1-879	Applying Counting Techniques to Permutations and Combinations
		HA1-560	Determining Probability of an Event and Complementary Event from a Random Experiment
		HA1-565	Solving Problems Involving Independent, Dependent, and Mutually Exclusive and Inclusive Events
S&P-6	The student demonstrates a conceptual understanding of probability and counting techniques by making predictions about the probability of independent or dependent events and using the information to solve problems (M6.4.5)	HA1-879	Applying Counting Techniques to Permutations and Combinations
		HA1-560	Determining Probability of an Event and Complementary Event from a Random Experiment
		HA1-565	Solving Problems Involving Independent, Dependent, and Mutually Exclusive and Inclusive Events
S&P-7	The student demonstrates a conceptual understanding of probability and counting techniques by designing, conducting, analyzing, and communicating the results of a probability experiment (L) (M6.4.6)	HA1-879	Applying Counting Techniques to Permutations and Combinations
		HA1-560	Determining Probability of an Event and Complementary Event from a Random Experiment
		HA1-565	Solving Problems Involving Independent, Dependent, and Mutually Exclusive and Inclusive Events
	<b>PROBLEM SOLVING</b>		
PS-1	The student demonstrates an ability to problem solve by selecting, modifying, and applying a variety of problem-solving strategies (e.g., charts, graphing, inductive and deductive reasoning, Venn diagrams) and verifying the results (M7.4.2)	Throughout	Standard is demonstrated throughout. For examples, please see the following:
		HA1-545	Making a Frequency Distribution Table
		HA1-380	Graphing Linear Equations
		HA1-441	Applications of Functions and Relations Involving Distance, Rate, and Time
		HA1-449	Applying Inductive and Deductive Reasoning
		HA1-886	Unions and Intersections of Sets Using Venn Diagrams
PS-2	The student demonstrates an ability to problem solve by evaluating, interpreting, and justifying solutions to problems by using an alternative strategy (M7.4.3)	Throughout	Standard is demonstrated throughout. For examples, please see the following:
		HA1-150	Writing an Equation to Solve Word Problems
		HA1-155	Writing an Equation to Solve Consecutive Integer Problems
		HA1-124	Using a Concrete Model to Solve One- and Two-Step Equations
		HA1-382	Solving Linear Equations Using the Graphing Calculator
PS-3	The student communicates his or her mathematical thinking by representing mathematical problems numerically, graphically, and/or symbolically, translating among these alternative representations; or using appropriate vocabulary, symbols, or technology to explain, justify, and defend strategies and solutions (M8.4.1, M8.4.2, & M8.4.3)	Throughout	Standard is demonstrated throughout. For examples, please see the following:
		HA1-104	Translating Word Statements into Equations
		HA1-105	Translating Word Statements into Inequalities

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		HA1-100	Finding Solution Sets of Open Sentences from Given Replacement Sets
		HA1-079	Using a Concrete Model to Simplify Algebraic Expressions
		HA1-124	Using a Concrete Model to Solve One- and Two-Step Equations
		HA1-144	Using a Concrete Model to Solve Equations with Variables on Both Sides
		HA1-890	Using Models to Derive Formulas for Two-Dimensional Geometric Figures
		HA1-891	Using Models to Derive Formulas for Three-Dimensional Solids
PS-4	The student demonstrates an ability to use logic and reason by following and evaluating an argument, judging its validity using inductive or deductive reasoning and logic; or making and testing conjectures (M9.4.1 & M9.4.2)	Throughout	Standard is demonstrated throughout. For examples, please see the following:
		HA1-449	Applying Inductive and Deductive Reasoning
		HA1-130	Identifying Postulates, Theorems, and Properties
		HA1-881	Completing and Validating Algebraic Proofs
		HA1-805	Applying Algebra Concepts
PS-5	The student demonstrates the ability to apply mathematical skills and processes across the content strands by using real-world contexts such as science, humanities, peers, community, careers, and national issues (M10.4.1 & M10.4.2)	Throughout	Standard is demonstrated throughout. Journal questions and Problem Sets of the Day include real-world contexts. For examples, please see the following:
		HA1-441	Applications of Functions and Relations Involving Distance, Rate, and Time
		HA1-442	Interpreting Graphs of Functions in Real-Life Situations
		HA1-960	Real-World Applications of Linear Functions
		HA1-945	Real-World Applications of Quadratic Functions

\*\* Indicates the benchmark standards that are assessed at the local district level.

MM1-Fundamentals of Mathematics

MPA- Pre-Algebra

HA1-Algebra 1

Note: Standards were taken from the Grade 9 Alaska Mathematics Performance Standards K-12 document adopted by the Alaska State Board of Education and Early Development on June 10, 2005.