MATH

GRADUATION PROFICIENCIES AND SUPPORTING STANDARDS

GRADUATION PROFICIENCY

GRADUATION PROFICIENCY #1:

NUMBER, QUANTITY, AND THE NUMBER SYSTEM

Students will reason, describe, and analyze quantitatively using numbers and units to solve real-world problems.

K - 6 Supporting Standards

7 - 12 Supporting Standards

GRADUATION PROFICIENCY #2:

ALGEBRAIC REASONING

Students will create, interpret, use, and analyze expressions, equations, and inequalities to solve real-world problems.

K - 6 Supporting Standards

7 - 12 Supporting Standards

GRADUATION PROFICIENCY #3:

FUNCTIONS AND RELATIONSHIPS

Students will use functions including linear, quadratic, trigonometric and exponential, to interpret and analyze a variety of real-world contexts.

K - 6 Supporting Standards

7 - 12 Supporting Standards

GRADUATION PROFICIENCY #4:

GEOMETRY AND MEASUREMENT

Students will apply concepts of geometry, spatial reasoning, and measurement to interpret and analyze a variety of real-world contexts.

K - 6 Supporting Standards

7 - 12 Supporting Standards

GRADUATION PROFICIENCY #5:

DATA, STATISTICS, AND PROBABILITY

Students will apply principles of statistics and probability to analyze and interpret data, reach and justify conclusions and make inferences and predictions in real-world contexts.

K - 6 Supporting Standards

7 - 12 Supporting Standards

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Supervisory Union & School District LAMOILLE NORTH
Equity, Access, and Opportunity

#1 NUMBER, QUANTITY, AND THE NUMBER SYSTEM

Students will reason, describe, and analyze quantitatively using numbers and units to solve real-world problems.

#1 SUPPORTING STANDARDS K - 6

Students will...

	K	1	2	3	4	5	6
A	Count forward and backward to 100 by ones and by tens.	Count forward and backward to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	Count forward and backward within 1000; skip-count by 5s, 10s, and 100s.	Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b. *Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.	Use place value understanding to round multi-digit whole numbers to any place.	Use place value understanding to round decimals to any place.	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values. Use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
B	Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	Understand that the two digits of a two-digit number represent amounts of tens and ones.	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones.	Understand a fraction as a number on the number line; represent fractions on a number line diagram. *Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	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.
C	Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. *Grade 3 expectations in this	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers	Read, write, and compare decimals to thousandths.	Understand ordering and absolute value of rational numbers.

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	K	1	2	3	4	5	6
		<.	comparisons.	domain are limited to fractions with denominators 2, 3, 4, 6, and 8.	based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.		
D	Count to tell the number of objects and answer “how many” questions.	Mentally find 10 more or 10 less than the number, when given a two-digit number, without having to count; explain the reasoning used.	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.		Compare two fractions with different numerators and different denominators. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions. *Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.		Solve 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.
E	Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group. * Include groups with up to ten objects.	Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.		Use decimal notation for fractions with denominators 10 or 100.		

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	K	1	2	3	4	5	6
F	Find the number that makes 10 when added to the given number. *For any number from 1 to 9				Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions.		

#1 NUMBER, QUANTITY, AND THE NUMBER SYSTEM

Students will reason, describe, and analyze quantitatively using numbers and units to solve real-world problems.

#1 SUPPORTING STANDARDS 7 - 12

Students will...

	7	8	ALGEBRA	ALGEBRA II	OTHER MATH (4TH COURSE)
A	Add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	Solve quadratic equations with real coefficients that have complex solutions.	Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.

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	7	8	ALGEBRA	ALGEBRA II	OTHER MATH (4TH COURSE)
B	Multiply and divide rational numbers.		Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	Extend polynomial identities to the complex numbers. For example, rewrite $x^2 + 4$ as $(x + 2i)(x – 2i)$.	Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. For example, $(–1 + \sqrt{3}\, i)^3 = 8$ because $(–1 + \sqrt{3}\, i)$ has modulus 2 and argument 120°.
C	Solve problems involving the four operations with rational numbers.			Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.
D					Perform operations on vectors to solve problems.
E					Perform operations on matrices and use matrices in applications to solve problems.

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#2 ALGEBRAIC REASONING

Students will create, interpret, use, and analyze expressions, equations, and inequalities to solve real-world problems.

#2 SUPPORTING STANDARDS K - 6

Students will...

	K	1	2	3	4	5	6
A	Fluently add and subtract within 5.	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10 using mental strategies.	Fluently add and subtract within 20 using mental strategies.* By end of Grade 2, know from memory all sums of two one-digit numbers.	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations.	Fluently add and subtract within 1,000,000 By the end of Grade 4, know from memory all products of two one-digit numbers.	Fluently multiply multi-digit whole numbers using the standard algorithm.	Fluently divide multi-digit numbers using the standard algorithm.
B	Solve addition and subtraction word problems within 10.	Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.	Determine the unknown whole number in a multiplication or division equation relating three whole numbers.	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations.	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.	Apply and extend previous understanding of multiplication and division to divide fractions by fractions.
C		Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.		Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and	Add, subtract, multiply, and divide decimals to hundredths. Relate the strategy used to a written method and explain the reasoning.	Write and evaluate numerical expressions involving whole-number exponents.

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GRADUATION PROFICIENCIES AND SUPPORTING STANDARDS

	K	1	2	3	4	5	6
					division.		
D		Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions.		Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Understand a fraction a/b with a > 1 as a sum of fractions 1/b. *Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.	Identify when two expressions are equivalent.
E					Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	Apply and extend previous understandings of multiplication and division to multiply and divide a fraction or whole number by a fraction.	Write an inequality of the form x > c or x < c to represent a constraint or condition in a 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.

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#2 ALGEBRAIC REASONING

Students will create, interpret, use, and analyze expressions, equations, and inequalities to solve real-world problems.

#2 SUPPORTING STANDARDS 7 - 12

Students will...

	7	8	ALGEBRA I	ALGEBRA II	OTHER MATH (4TH COURSE)
A	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	Interpret the structure of linear, exponential, and quadratic expressions.	Interpret the structure of polynomial and rational expressions.	Represent a system of linear equations as a single matrix equation in a vector variable.
B	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.	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. (quadratic and exponential)	Use the structure of an expression to identify ways to rewrite it. For example, see x^4 – y^4 as (x^2)^2 – (y^2)^2, thus recognizing it as a difference of squares that can be factored as (x^2 – y^2)(x^2 + y^2).	Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).
C	Use variables to represent quantities in a problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities.	Perform arithmetic operations on polynomials (linear and quadratic)	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	

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	7	8	ALGEBRA I	ALGEBRA II	OTHER MATH (4TH COURSE)
D		Solve linear equations in one variable.	Create equations and inequalities in one variable and use them to solve problems. (Linear, quadratic, and exponential)	Create equations and inequalities in one variable and use them to solve problems. (Equations using all available types of expressions, including simple root functions.)	
E		Analyze and solve pairs of simultaneous linear equations.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (Linear, quadratic, and exponential)	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (Equations using all available types of expressions, including simple root functions.)	
F			Solve quadratic equations in one variable.	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	
G			Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables.		
H			Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the		

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	7	8	ALGEBRA I	ALGEBRA II	OTHER MATH (4TH COURSE)
			intersection of the corresponding half-planes.		

#3 FUNCTIONS AND RELATIONSHIPS

Students will use functions including linear, quadratic, trigonometric and exponential, to interpret and analyze a variety of real-world contexts.

#3 SUPPORTING STANDARDS K - 6:

Students will...

	K	1	2	3	4	5	6
A						Interpret multiplication as scaling (resizing).	Use ratio and rate reasoning to solve mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

#3 FUNCTIONS AND RELATIONSHIPS

Students will use functions including linear, quadratic, trigonometric and exponential, to interpret and analyze a variety of contexts.

#3 SUPPORTING STANDARDS 7-12:

Students will...

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	7	8	ALGEBRA I	ALGEBRA II	OTHER MATH (4TH COURSE)
A	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
B	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	Graph and interpret functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* (Linear, exponential, quadratic)	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	Verify by composition that one function is the inverse of another.
C		Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.* *Function notation is not required in Grade 8.	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	Build a function that models a relationship between two quantities by combining standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.*	Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.
D		Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading		Graph and interpret functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. *Key features include: intercepts;*	Use special triangles to determine geometrically the values of sine, cosine, tangent for π/3, π/4 and π/6, and use the unit circle to express the values of sine, cosine, and tangent for π–x, π+x, and 2π–x in terms of their

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	7	8	ALGEBRA I	ALGEBRA II	OTHER MATH (4TH COURSE)
		these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.		*intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*	values for x, where x is any real number.
E		Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.		Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.
F				Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.	Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.

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#4 GEOMETRY AND MEASUREMENT

Students will apply geometry, spatial reasoning, and measurement concepts to real-world problems.

#4 SUPPORTING STANDARDS K - 6:

Students will...

	K	1	2	3	4	5	6
A	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.* *Limit category counts to be less than or equal to 10.	Order three objects by length; compare the lengths of two objects indirectly by using a third object.	Measure and estimate the length of an object in standard units.	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes.	Apply the area and perimeter formulas for rectangles in mathematical problems..	Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	
B			Measure the length of an object twice, using different length units; describe how the two measurements relate to the size of the unit chosen.	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).* Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units.		Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	
C			Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).		Relate volume to the operations of multiplication and addition. Solve problems involving volume.	

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	K	1	2	3	4	5	6
D			Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units.	Relate area to the operations of multiplication and addition.			

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#4 GEOMETRY AND MEASUREMENT

Students will apply concepts of geometry, spatial reasoning, and measurement in the context of real-world problems.

#4 SUPPORTING STANDARDS 7 - 12:

Students will...

	7	8	GEOMETRY	OTHER MATH (4TH COURSE)
A		Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	Prove the Laws of Sines and Cosines and use them to solve problems.
B		Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two- dimensional figures, describe a sequence that exhibits the similarity between them.	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.
C		Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	

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	7	8	GEOMETRY	OTHER MATH (4TH COURSE)
D		Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in mathematical problems in two and three dimensions.	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	
E		Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	
F			Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.	
G			Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	
H			Prove that all circles are similar.	

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	7	8	GEOMETRY	OTHER MATH (4TH COURSE)
I			Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	
J			Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).	
K			Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	

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#5 DATA, STATISTICS, AND PROBABILITY

Students will apply principles of statistics and probability to analyze and interpret data, reach and justify conclusions and make inferences and predictions in real-world contexts.

#5 SUPPORTING STANDARDS K - 6:

Students will...

	K	1	2	3	4	5	6
A			Represent and interpret data (picture and bar graph, line plot).	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.	
B				Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers,			

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	K	1	2	3	4	5	6
				halves, or quarters.			

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#5 DATA, STATISTICS, AND PROBABILITY

Students will apply principles of statistics and probability to analyze and interpret data, reach and justify conclusions and make inferences and predictions in real-world contexts.

#5 SUPPORTING STANDARDS 7 - 12:

Students will...

	7	8	ALGEBRA	ALGEBRA II	OTHER MATH (4TH COURSE)
A	Use 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. ** **Supporting Work**	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. ** **Supporting Work**	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	Compute (using technology) and interpret the correlation coefficient of a linear fit.
B	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. ** **Supporting Work**	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. ** **Supporting Work**	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	Distinguish between correlation and causation.
C	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. ** **Supporting Work**	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

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	7	8	ALGEBRA	ALGEBRA II	OTHER MATH (4TH COURSE)
		the same subjects. **** Supporting Work**			
D					Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.
E					Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.
F					Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.