Grade	Standard	Benchmark	Know/Appl	Indicator	Sub-Ind.		Assessed	Non-Calc	Fin. Lit.	(Non-Assessed Indicators) ▲ (Asessed Indicators)	Date	% Prof(+)	Date	% Prof(+)	Comments
8	1	1	K	1					$	Knows, explains, and uses equivalent representations for rational numbers and simple algebraic expressions including integers, fractions, decimals, percents, and ratios; rational number bases with integer exponents; rational numbers written in scientific notation with integer exponents; time; and money (2.4.K1a).					
8	1	1	K	2					$	Compares and orders rational numbers, the irrational number pi, and algebraic expressions (2.4.K1a), e.g., which expression is greater $-3n$ or $3n$? It depends on the value of n. If n is positive, $3n$ is greater. If n is negative, $-3n$ is greater. If n is zero, they are equal.					
8	1	1	K	3						Explains the relative magnitude between rational numbers, the irrational number pi, and algebraic expressions (2.4.K1a).					
8	1	1	K	4						Recognizes and describes irrational numbers (2.4.K1a), e.g., $\sqrt{2}$ is a non-repeating, non-terminating decimal; or p (pi) is a non-terminating decimal.					
8	1	1	K	5	a		▲			Knows and explains what happens to the product or quotient when (2.4.K1a): a positive number is multiplied or divided by a rational number greater than zero and less than one, e.g., if 24 is divided by 1/3, will the answer be larger than 24 or smaller than 24? Explain.					
8	1	1	K	5	b		▲			Knows and explains what happens to the product or quotient when (2.4.K1a): a positive number is multiplied or divided by a rational number greater than one.					
8	1	1	K	5	c		▲			Knows and explains what happens to the product or quotient when (2.4.K1a): a nonzero real number is multiplied or divided by zero.					
8	1	1	K	6						Explains and determines the absolute value of real numbers (2.4.K1a).					

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8	1	1	A	1					$	Generates and/or solves real-world problems using equivalent representations of rational numbers and simple algebraic expressions (2.4.A1a), e.g., a paper reports a company's gross income as $1.2 billion and their total expenses as $30,450,000. What is the company's net profit?					
8	1	1	A	2					$	Determines whether or not solutions to real-world problems using rational numbers, the irrational number pi, and simple algebraic expressions are reasonable (2.4.A1a), e.g., the city park is putting a picket fence around their circular rose garden. The garden has a diameter of 7.5 meters. The planner wants to buy 20 meters of fencing. Is this reasonable?					
8	1	2	K	1						Explains and illustrates the relationship between the subsets of the real number system [natural (counting) numbers, whole numbers, integers, rational numbers, irrational numbers] using mathematical models (2.4.K1a), e.g., number lines or Venn diagrams.					
8	1	2	K	2			▲			Identifies all the subsets of the real number system [natural (counting) numbers, whole numbers, integers, rational numbers, irrational numbers] to which a given number belongs (2.4.K1l). (For the purpose of assessment, irrational numbers will not be included.)					
8	1	2	K	3	a				$	Names, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (2.4.K1a): commutative, associative, distributive, and substitution properties [commutative: a + b = b + a and ab = ba; associative: a + (b + c) = (a + b) + c and a(bc) = (ab)c; distributive: a(b + c) = ab + ac; substitution: if a = 2, then 3a = 3 x 2 = 6];					

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8	1	2	K	3	b				$	Names, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (2.4.K1a): identity properties for addition and multiplication and inverse properties of addition and multiplication (additive identity: a + 0 = a, multiplicative identity: a • 1 = a, additive inverse: $^{+}5 + {}^{-}5 = 0$, multiplicative inverse: 8 x 1/8 = 1);					
8	1	2	K	3	c				$	Names, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (2.4.K1a): symmetric property of equality, e.g., 7 + 2 = 9 has the same meaning as 9 = 7 + 2;					
8	1	2	K	3	d				$	Names, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (2.4.K1a): addition and multiplication properties of equalities, e.g., if a = b, then a + c = b + c;					
8	1	2	K	3	e				$	Names, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (2.4.K1a): addition property of inequalities, e.g., if a > b, then a + c > b + c;					
8	1	2	K	3	f				$	Names, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (2.4.K1a): zero product property, e.g., if ab = 0, then a = 0 and/or b = 0.					
8	1	2	A	1					$	~~Generates and solves real-world problems with rational~~ numbers using the concepts of these properties to explain reasoning (2.4.A1a):					

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8	1	2	A	1	a		▲			Generates and/or solves real-world problems with rational numbers using the concepts of these properties to explain reasoning (2.4.A1a): commutative, associative, distributive, and substitution properties; e.g., we need to place trim around the outside edges of a bulletin board with dimensions of 3 ft by 5 ft. Explain two different methods of solving this problem and why the answers are equivalent.					
8	1	2	A	1	b		▲			Generates and/or solves real-world problems with rational numbers using the concepts of these properties to explain reasoning (2.4.A1a): identity and inverse properties of addition and multiplication; e.g., I had $50. I went to the mall and spent $20 in one store, $25 at a second store and then $5 at the food court. To solve: [$50 – ($20 + $25 + $5) = $50 - $50 = 0]. Explain your reasoning.					
8	1	2	A	1	c					Generates and/or solves real-world problems with rational numbers using the concepts of these properties to explain reasoning (2.4.A1a): symmetric property of equality; e.g., Sam took a $15 check to the bank and received a $10 bill and a $5 bill. Later Sam took a $10 bill and a $5 bill to the bank and received a check for $15. $15 = $10 + $5 is the same as $10 + $5 = $15					
8	1	2	A	1	d					Generates and/or solves real-world problems with rational numbers using the concepts of these properties to explain reasoning (2.4.A1a): addition and multiplication properties of equality; e.g., the total price (P) of a car, including tax (T), is $14, 685. 33. If the tax is $785.42, what is the sale price of the car (S)?					
8	1	2	A	1	e					Generates and/or solves real-world problems with rational numbers using the concepts of these properties to explain reasoning (2.4.A1a): zero product property, e.g., Jenny was thinking of two numbers. Jenny said that the product of the two numbers was 0. What could you deduct from this statement? Explain your reasoning					

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8	1	2	A	2					$	Analyzes and evaluates the advantages and disadvantages of using integers, whole numbers, fractions (including mixed numbers), or decimals in solving a given real-world problem (2.4.A1a), e.g., in the store everything is 33 1/3% off. When calculating the discount, which representation of 33 1/3% would you use and why?					
8	1	3	K	1					$	Estimates real number quantities using various computational methods including mental math, paper and pencil, concrete objects, and/or appropriate technology (2.4.K1a).					
8	1	3	K	2					$	Uses various estimation strategies and explains how they were used to estimate real number quantities and simple algebraic expressions (2.4.K1a).					
8	1	3	K	3						Knows and explains why a decimal representation of the irrational number pi is an approximate value (2.4.K1c).					
8	1	3	K	4						Knows and explains between which two consecutive integers an irrational number lies (2.4.K1a).					
8	1	3	A	1					$	Adjusts original rational number estimate of a real-world problem based on additional information (a frame of reference) (2.4.A1a), e.g., estimate the height of a building from a picture. In another picture, a person is standing next to the building. By using the person as a frame of reference adjust your original estimate.					
8	1	3	A	2					$	Estimates to check whether or not the result of a real-world problem using rational numbers and/or simple algebraic expressions is reasonable and makes predictions based on the information (2.4.A1a), e.g., you have a $4,000 debt on a credit card. You pay the minimum of $30 per month. Is it reasonable to pay off the debt in 10 years?					
8	1	3	A	3					$	Determines a reasonable range for the estimation of a quantity given a real-world problem and explains the reasonableness of the range (2.4.A1c), e.g., determine the reasonable range for the weight of a book and explain why this range is reasonable.					

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8	1	3	A	4					$	Determines if a real-world problem calls for an exact or approximate answer and performs the appropriate computation using various computational methods including mental mathematics, paper and pencil, concrete objects, and/or appropriate technology (2.4.A1a), e.g., do you need an exact or an approximate answer when calculating the area of the walls in a room to determine the number of rolls of wallpaper needed to paper the room?. An approximation is appropriate for the area but an exact answer is needed for the number of roles. What would you do if you were wallpapering 2 rooms?					
8	1	3	A	5					$	Explains the impact of estimation on the result of a real-world problem (underestimate, overestimate, range of estimates) (2.4.A1a), e.g., you are estimating the total of three large purchases ($489, $553, and $92). If you rounded each to the nearest $10, would your estimate be slightly lower or higher than the actual amount spent? If you rounded each to the nearest $100, would your estimate be slightly lower or higher than the actual amount spent?					
8	1	4	K	1					$	Computes with efficiency and accuracy using various computational methods including mental math, paper and pencil, concrete objects, and appropriate technology (2.4.K1a).					
8	1	4	K	2	a		▲	N		Performs and explains these computational procedures with rational numbers (2.4.K1a): addition, subtraction, multiplication, and division of integers					
8	1	4	K	2	b		▲	N		Performs and explains these computational procedures with rational numbers (2.4.K1a): order of operations (evaluates within grouping symbols, evaluates powers to the second or third power, multiplies or divides in order from left to right, then adds or subtracts in order from left to right);					

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8	1	4	K	2	c					Performs and explains these computational procedures with rational numbers (2.4.K1a): approximation of roots of numbers using calculators;					
8	1	4	K	2	d	1				Performs and explains these computational procedures with rational numbers (2.4.K1a): multiplication or division to find: a percent of a number, e.g., what is 0.5% of 10?					
8	1	4	K	2	d	2				Performs and explains these computational procedures with rational numbers (2.4.K1a): multiplication or division to find: percent of increase and decrease, e.g., if two coins are removed from ten coins, what is the percent of decrease?					
8	1	4	K	2	d	3				Performs and explains these computational procedures with rational numbers (2.4.K1a): multiplication or division to find: percent one number is of another number, e.g., what percent of 80 is 120?					
8	1	4	K	2	d	4				Performs and explains these computational procedures with rational numbers (2.4.K1a): multiplication or division to find: a number when a percent of the number is given, e.g., 15% of what number is 30?					
8	1	4	K	2	e					Performs and explains these computational procedures with rational numbers (2.4.K1a): addition of polynomials, e.g., (3x – 5) + (2x + 8).					
8	1	4	K	2	f					Performs and explains these computational procedures with rational numbers (2.4.K1a): simplifies algebraic expressions in one variable by combining like terms or using the distributive property (2.4.K1a), e.g., –3(x – 4) is the same as –3x + 12.					
8	1	4	K	3						Finds factors and common factors of simple monomial expressions (2.4.K1d), e.g., given the monomials $10m^2n^3$ and $15a^2mn^2$ some common factors would be 5m, $5mn^2$, and n^2.					

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8	1	4	A	1	a		▲			Generates and/or solves one- and two-step real-world problems using computational procedures and mathematical concepts (2.4.A1a) with: rational numbers, e.g., find the height of a triangular garden given that the area to be covered is 400 square feet with a base of 12½ feet;					
8	1	4	A	1	b		▲			Generates and/or solves one- and two-step real-world problems using computational procedures and mathematical concepts (2.4.A1a) with: the irrational number pi as an approximation, e.g., before planting, a farmer plows a circular region that has an approximate area of 7,300 square feet. What is the radius of the circular region to the nearest tenth of a foot?					
8	1	4	A	1	c		▲			Generates and/or solves one- and two-step real-world problems using computational procedures and mathematical concepts (2.4.A1a) with: applications of percents, e.g., sales tax or discounts. (For the purpose of assessment, percents greater than or equal to 100% will NOT be used).					
8	2	1	K	1	a					Identifies, states, and continues a pattern presented in various formats including numeric (list or table), algebraic (symbolic notation), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes: counting numbers including perfect squares, cubes, and factors and multiples with positive rational numbers (number theory) (2.4.K1a).					

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8	2	1	K	1	b					Identifies, states, and continues a pattern presented in various formats including numeric (list or table), algebraic (symbolic notation), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes: rational numbers including arithmetic and geometric sequences (arithmetic: sequence of numbers in which the difference of two consecutive numbers is the same, geometric: a sequence of numbers in which each succeeding term is obtained by multiplying the preceding term by the same number) (2.4.K1a), e.g., 1, 1, 3, …; 4 2 4					
8	2	1	K	1	c					Identifies, states, and continues a pattern presented in various formats including numeric (list or table), algebraic (symbolic notation), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes: geometric figures (2.4.K1h);					
8	2	1	K	1	d					Identifies, states, and continues a pattern presented in various formats including numeric (list or table), algebraic (symbolic notation), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes: measurements (2.4.K1a);					
8	2	1	K	1	e				$	Identifies, states, and continues a pattern presented in various formats including numeric (list or table), algebraic (symbolic notation), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes: things related to daily life;					
8	2	1	K	1	f					Identifies, states, and continues a pattern presented in various formats including numeric (list or table), algebraic (symbolic notation), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes: variables and simple expressions, e.g., 1 – x, 2 – x, 3 – x, 4 – x, ...; or x, x2, x3, ...					
8	2	1	K	2						Generates and explains a pattern (2.4.K1a).					

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8	2	1	K	3						Generates a pattern limited to two operations (addition, subtraction, multiplication, division, exponents) when given the rule for the nth term (2.4.K1a), e.g., the n^{th} term is n^2+1, find the first 4 terms beginning with n = 1; the terms are 2, 5, 10, and 17.					
8	2	1	K	4						States the rule to find the nth term of a pattern using explicit symbolic notation (2.4.K1a), e.g., given 2, 5, 8, 11, …; find the rule for the nth term, the rule is 3n –1.					
8	2	1	K	5						Describes the pattern when given a table of linear values and plots the ordered pairs on a coordinate plane (2.4.K1f-g), e.g., in the table below, the pattern could be described as the x-coordinates are increasing by three, while the y-coordinates are increasing by 6, or the x is doubled and one is added to find the y. X 2 5 8 11 ? Y 5 11 17 23					
8	2	1	A	1					$	Generalizes numerical patterns using algebra and then translates between the equation, graph, and table of values resulting from the generalization (2.4.A1d-e,j), e.g., water is billed at $1.00 per 1,000 gallons, plus a basic fee of $10 per month for being connected to the water district. 1,000 Gallons | Cost in a given month Graphthese: 1 | $10 + 1*1.00 à (1, 11) 2 | $10 + 2*.1.00 à (2, 12) . | . . | . n | 10 + n*1.00 à (n, 1.00n + 10) where C = total cost and G = gallons used, C = 1.00 G + 10]					
8	2	1	A	2					$	Recognizes the same general pattern presented in different representations [numeric (list or table), visual (picture, table, or graph), and written] (2.4.A1a,j).					

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8	2	2	K	1						Identifies independent and dependent variables within a given situation.					
8	2	2	K	2						Simplifies algebraic expressions in one variable by combining like terms or using the distributive property (2.4.K1a), e.g., $^{-}3(x - 4)$ is the same as $^{-}3 x + 12$.					
8	2	2	K	3	a		▲		$	Solves (2.4.K1a,e): one- and two-step linear equations in one variable with rational number coefficients and constants intuitively and/or analytically;					
8	2	2	K	3	b				$	Solves (2.4.K1a,e): one-step linear inequalities in one variable with rational number coefficients and constants intuitively, analytically, and graphically;					
8	2	2	K	3	c				$	Solves (2.4.K1a,e): systems of given linear equations with whole number coefficients and constants graphically.					
8	2	2	K	4						Knows and describes the mathematical relationship between ratios, proportions, and percents and how to solve for a missing monomial or binomial term in a proportion (2.4.K1c), e.g., 2/5 = 1/ X+2					
8	2	2	K	5	a				$	Represents and solves algebraically: the number when a percent and a number are given,					
8	2	2	K	5	b				$	Represents and solves algebraically: what percent one number is of another number,					
8	2	2	K	5	c				$	Represents and solves algebraically: percent of increase or decrease, e.g., the price of a loaf of bread is $2.00. With a coupon, the cost is $1.00. What is the percent of decrease?					
8	2	2	K	6					$	Evaluates formulas using substitution.					
8	2	2	A	1	a		▲ ■		$	Represents real-world problems using (2.4.A1d): variables, symbols, expressions, one- or two-step equations with rational number coefficients and constants, e.g., today John is 3.25 inches more than half his sister's height. If J = John's height, and S = his sister's height, then J = 0.5S + 3.25.					

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8	2	2	A	1	b				$	Represents real-world problems using (2.4.A1d): one-step inequalities with rational number coefficients and constants, e.g., after Randy paid $38.50 for a watch, he did not have enough money to by a calculator for $5.50. Represent this situation with an inequality.					
8	2	2	A	1	c				$	Represents real-world problems using (2.4.A1d): systems of linear equations with whole number coefficients and constants, e.g., two students collected the same amount of money for a walk-a-thon. One student received $5 per mile and a donation of $10, while the other student received $2 per mile and a donation of $20. How many miles did they walk?					
8	2	2	A	2						Solves real-world problems with two-step linear equations in one variable with rational number coefficients and constants and rational solutions intuitively, analytically, and graphically (2.4.A1e) e.g., Mike and Albert are friends, but Joe and Albert are not friends. Which of the following diagrams can be used to describe this situation? (Three dots labeled J, M, A: there is a line between J and M and line between M and A, but no line between J and A.)					
8	2	2	A	3	a				$	Generates real-world problems that represent (2.4.A1d): one- or two-step linear equations, e.g., given the equation 2x + 10 = 30, the problem could be I bought two shirts and a pair of pants for $10. How much was a shirt, if the total bill was $30?					
8	2	2	A	3	b				$	Generates real-world problems that represent (2.4.A1d): one-step linear inequalities, e.g., write a real-world situation that represents the inequality x + 10 > 30. The problem could be: If you give me $10, I will have more than $30.					

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8	2	2	A	4					$	Explains the mathematical reasoning that was used to solve a real-world problem using one- or two-step linear equations and inequalities and discusses the advantages and disadvantages to various strategies that may have been used to solve the problem, (2.4.A1d), e.g., given the inequality x + 10 > 30, subtract the same number from both sides of the inequality or graph as y1 = x + 10 and y = 30 and find on the graph where y1 is less than y2. The first method gives an exact answer; the second method is a visual representation and can be used to solve more difficult inequalities.					
8	2	3	K	1					$	Recognizes and examines constant, linear, and nonlinear relationships using various methods including mental math, paper and pencil, concrete objects, and graphing utilities or appropriate technology (2.4.K1a,e-g).					
8	2	3	K	2						Knows and describes the difference between constant, linear, and nonlinear relationships (2.4.K1g).					
8	2	3	K	3						Explains the concepts of slope and x- and y-intercepts of a line (2.4.K1g).					
8	2	3	K	4					$	Recognizes and identifies the graphs of constant and linear functions (2.4.K1g).					
8	2	3	K	5						Identifies ordered pairs from a graph, and/or plots ordered pairs using a variety of scales for the x- and y-axis (2.4.K1g).					
8	2	3	A	1					$	Represents a variety of constant and linear relationships using written or oral descriptions of the rule, tables, graphs, and symbolic notation (2.4.A1d-f).					
8	2	3	A	2					$	Interprets, describes, and analyzes the mathematical relationships of numerical, tabular, and graphical representations (2.4.A1j).					

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8	2	3	A	3			▲			Translates between the numerical, tabular, graphical, and symbolic representations of linear relationships with integer coefficients and constants (2.4.A1a), e.g., a fish tank is being filled with water with a 2-liter jug. There are already 5 liters of water in the fish tank. Therefore, you are showing how full the tank is as you empty 2-liter jugs of water into it. Y = 2x + 5 (symbolic) can be represented in a table (tabular) – and as a graph (graphical) –					
8	2	4	K	1	a				$	Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: process models (concrete objects, pictures, diagrams, number lines, hundred charts, measurement tools, multiplication arrays, division sets, or coordinate grids) to model computational procedures, algebraic relationships, and mathematical relationships and to solve equations (1.1.K1-6, 1.2.K1, 1.2.K3, 1.3.K1-2, 1.3.K4, 1.4.K1-2, 2.1.K1a-b, 2.1.K1d-e, 2.1.K2-4, 2.2.K2-3, 3.1.K9, 3.2.K1-4, 3.3.K1-4, 3.4.K4, 4.2.K4-5);					
8	2	4	K	1	b				$	Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: place value models (place value mats, hundred charts, base ten blocks, or unifix cubes) to compare, order, and represent numerical quantities and to model computational procedures;					
8	2	4	K	1	c				$	Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: fraction and mixed number models (fraction strips or pattern blocks) and decimal and money models (base ten blocks or coins) to compare, order, and represent numerical quantities (1.3.K3, 2.3.K6):					

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8	2	4	K	1	d					Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: factor trees to model least common multiple, greatest common factor, and prime factorization (1.4.K3);					
8	2	4	K	1	e				$	Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: equations and inequalities to model numerical relationships (2.2.K3, (3.4.K2);					
8	2	4	K	1	f				$	Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: function tables to model numerical and algebraic relationships (2.1.K5, 3.4.K2);					
8	2	4	K	1	g				$	Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: coordinate planes to model relationships between ordered pairs and linear equations and inequalities (2.1.K5, 2.3.K1-5, 3.4.K2-3);					
8	2	4	K	1	h					Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: two- and three-dimensional geometric models (geoboards, dot paper, nets, or solids) and real-world objects to model perimeter, area, volume, surface area, and properties of two-and three-dimensional figures (2.1.K1c, 3.1.K1-6, 3.1.K8, 3.1.K10, 3.2.K5, 3.3.K4-5);					
8	2	4	K	1	i					Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: scale drawings to model large and small real-world objects (3.3.K3-4);					

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8	2	4	K	1	j				$	Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: geometric models (spinners, targets, or number cubes), process models (coins, pictures, or diagrams), and tree diagrams to model probability (4.1.K1-5);					
8	2	4	K	1	k				$	Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: frequency tables, bar graphs, line graphs, circle graphs, Venn diagrams, charts, tables, single and double stem-and-leaf plots, scatter plots, box-and-whisker plots, and histograms to organize and display data (4.2.K1, 4.2.K6);					
8	2	4	K	1	l					Knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include: Venn diagrams to sort data and to show relationships (1.2.K2).					
8	2	4	A	1	a					Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include:					
8	2	4	A	1	b				$	Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: place value models (place value mats, hundred charts, base ten blocks, or unifix cubes) to model problem situations;					
8	2	4	A	1	c				$	Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: fraction and mixed number models (fraction strips or pattern blocks) and decimal and money models (base ten blocks or coins) to compare, order, and represent numerical quantities (3.2.A3);					

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8	2	4	A	1	d				$	Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: equations and inequalities to model numerical relationships(2.1.A2, 2.2.A1-2, 2.3.A1, 3.4.A2);					
8	2	4	A	1	e				$	Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: function tables to model numerical and algebraic relationships (2.1.A2, 2.3.A2, 3.4.A2);					
8	2	4	A	1	f				$	Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: coordinate planes to model relationships between ordered pairs and linear equations and inequalities (2.3.A1 3.4.A2);					
8	2	4	A	1	g					Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: two- and three-dimensional geometric models (geoboards, dot paper, nets, or solids) and real-world objects to model perimeter, area, volume, surface area and properties of two- and three-dimensional figures (3.3.A3, 3.4.A2);					
8	2	4	A	1	h					Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: scale drawings to model large and small real-world objects (3.1.A1-2, 3.3.A4);					
8	2	4	A	1	i					Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: geometric models (spinners, targets, or number cubes), process models (coins, pictures, or diagrams), and tree diagrams to model probability (4.1.A1-4);					

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8	2	4	A	1	j				$	Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: frequency tables, bar graphs, line graphs, circle graphs, Venn diagrams, charts, tables, single and double stem-and-leaf plots, scatter plots, box-and-whisker plots, and histograms to describe, interpret, and analyze data (2.1.A1-2, 2.3.A2-3, 4.2.A1, 4.2.A3, 4.2.A1-3);					
8	2	4	A	1	k					Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: Venn diagrams to sort data and to show relationships.					
8	2	4	A	2			▲		$	Etermines if a given graphical, algebraic, or geometric model is an accurate representation of a given real-world situation.					
8	2	4	A	3					$	Uses the mathematical modeling process to analyze and make inferences about real-world situations.					
8	3	1	K	1						Recognizes and compares properties of two- and three-dimensional figures using concrete objects, constructions, drawings, appropriate terminology, and appropriate technology (2.4.K1h).					
8	3	1	K	2	a					Discusses properties of triangles and quadrilaterals related to (2.4.K1h):					
8	3	1	K	2	b					Discusses properties of triangles and quadrilaterals related to (2.4.K1h): sum of the interior angles of any quadrilateral is 360°;					
8	3	1	K	2	c					Discusses properties of triangles and quadrilaterals related to (2.4.K1h): parallelograms have opposite sides that are parallel and congruent, opposite angles are congruent;					
8	3	1	K	2	d					Discusses properties of triangles and quadrilaterals related to (2.4.K1h): rectangles have angles of 90°, sides may or may not be equal;					

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8	3	1	K	2	e					Discusses properties of triangles and quadrilaterals related to (2.4.K1h): rhombi have all sides equal in length, angles may or may not be equal;					
8	3	1	K	2	f					Discusses properties of triangles and quadrilaterals related to (2.4.K1h): squares have angles of 90°, all sides congruent;					
8	3	1	K	2	g					Discusses properties of triangles and quadrilaterals related to (2.4.K1h): trapezoids have one pair of opposite sides parallel and the other pair of opposite sides are not parallel;					
8	3	1	K	2	h					Discusses properties of triangles and quadrilaterals related to (2.4.K1h): kites have two distinct pairs of adjacent congruent sides.					
8	3	1	K	3						Recognizes and describes the rotational symmetries and line symmetries that exist in two-dimensional figures (2.4.K1h), e.g., draw a picture with a line of symmetry in it. Explain why it is a line of symmetry.					
8	3	1	K	4						Recognizes and uses properties of corresponding parts of similar and congruent triangles and quadrilaterals to find side or angle measures using standard notation for similarity (~) and congruence(2.4.K1h).					
8	3	1	K	5						Knows and describes Triangle Inequality Theorem to determine if a triangle exists (2.4.K1h).					
8	3	1	K	6	a		▲			Uses the Pythagorean theorem to (2.4.K1h): determine if a triangle is a right triangle,					
8	3	1	K	6	b		▲			Uses the Pythagorean theorem to (2.4.K1h): find a missing side of a right triangle where the lengths of all three sides are whole numbers.					
8	3	1	K	7						Recognizes and compares the concepts of a point, line, and plane.					
8	3	1	K	8						Describes the intersection of plane figures, e.g., two circles could intersect at no point, one point, two points, or all points.					

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8	3	1	K	9	a					Describes and explains angle relationships: when two lines intersect including vertical and supplementary angles;					
8	3	1	K	9	b					Describes and explains angle relationships: when formed by parallel lines cut by a transversal including corresponding, alternate interior, and alternate exterior angles.					
8	3	1	K	10						Recognizes and describes arcs and semicircles as parts of a circle and uses the standard notation for arc (Ç) and circle (8) (2.4.K1h).					
8	3	1	A	1	a		▲ ■			Solves real-world problems by (2.4.A1a): using the properties of corresponding parts of similar and congruent figures, e.g., scale drawings, map reading, proportions, or indirect measurements.					
8	3	1	A	1	b					Solves real-world problems by (2.4.A1a): applying the Pythagorean Theorem, e.g., indirect measurements, map reading/distance, or diagonals.					
8	3	2	K	1					$	Determines and uses rational number approximations (estimations) for length, width, weight, volume, temperature, time, perimeter, area, and surface area using standard and nonstandard units of measure (2.4.K1a).					
8	3	2	K	2					$	Selects and uses measurement tools, units of measure, and level of precision appropriate for a given situation to find accurate real number representations for length, weight, volume, temperature, time, perimeter, area, surface area, and angle measurements (2.4.K1a).					
8	3	2	K	3						Converts within the customary system and within the metric system.					
8	3	2	K	4						Estimates the measure of a concrete object in one system given the measure of that object in another system and the approximate conversion factor (2.4.K1a), e.g., a mile is about 2.2 kilometers; how far is 2 miles?					
8	3	2	K	5	a					Uses given measurement formulas to find (2.4.K1h): area of parallelograms and trapezoids;					

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8	3	2	K	5	b					Uses given measurement formulas to find (2.4.K1h): surface area of rectangular prisms, triangular prisms, and cylinders;					
8	3	2	K	5	c					Uses given measurement formulas to find (2.4.K1h): volume of rectangular prisms, triangular prisms, and cylinders.					
8	3	2	K	6						Recognizes how ratios and proportions can be used to measure inaccessible objects (2.4.K1c), e.g., using shadows to measure the height of a flagpole.					
8	3	2	K	7						Calculates rates of change, e.g., speed or population growth.					
8	3	2	A	1	a				$	Solves real-world problems (2.4.A1a) by: converting within the customary and the metric systems, e.g., James added 30 grams of sand to his model boat that weighed 2 kg before it sank. With the sand included, what is the total weight of his boat?					
8	3	2	A	1	b				$	Solves real-world problems (2.4.A1a) by: finding perimeter and area of circles, squares, rectangles, triangles, parallelograms, and trapezoids; e.g., Jane jogs on a circular track with a radius of 100 feet. How far would she jog in one lap?					
8	3	2	A	1	c				$	Solves real-world problems (2.4.A1a) by: finding the volume and surface area of rectangular prisms, e.g., how much paint would be needed to cover a box with dimensions of 3 feet by 4 feet by 5 feet?					
8	3	2	A	2					$	Estimates to check whether or not measurements or calculations for length, weight, volume, temperature, time, perimeter, area, and surface area in real world problems are reasonable and adjusts original measurement or estimation based on additional information (a frame of reference) (2.4.A1a), e.g., to check your calculation in finding the area of the floor in the kitchen; you count how many foot-square tiles there are on the floor.					

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8	3	2	A	3						Uses ratio and proportion to measure inaccessible objects (2.4.A1c), e.g., using the length of a shadow to measure the height of a flagpole.					
8	3	3	K	1						Identifies, describes, and performs single and multiple transformations [reflection, rotation, translation, reduction (contraction/shrinking), enlargement (magnification/growing)] on a two-dimensional figure (2.4.K1a).					
8	3	3	K	2						Describes a reflection of a given two-dimensional figure that moves it from its initial placement (preimage) to its final placement (image) in the coordinate plane over the x- and y-axis (2.4.K1a,i).					
8	3	3	K	3	a					Draws (2.4.K1a): three-dimensional figures from a variety of perspectives (top, bottom, sides, corners);					
8	3	3	K	3	b					Draws (2.4.K1a): a scale drawing of a two-dimensional figure;					
8	3	3	K	3	c					Draws (2.4.K1a): a two-dimensional drawing of a three-dimensional figure.					
8	3	3	K	4						Determines how and where an object an object or a shape can be tessellated using single or multiple transformations (2.4.K1a)					
8	3	3	A	1						Generalizes the impact of transformations on the area and perimeter of any two-dimensional geometric figure (2.4.A1a), e.g., enlarging by a factor of three triples the perimeter (circumference) and multiplies the area by a factor of nine.					
8	3	3	A	2						Describes and draws a two-dimensional figure after undergoing two specified transformations without using a concrete object.					
8	3	3	A	3						Investigates congruency, similarity, and symmetry of geometric figures using transformations (2.4.A1g).					

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8	3	3	A	4						Uses a scale drawing to determine the actual dimensions and/or measurements of a two-dimensional figure represented in a scale drawing (2.4.A1h).					
8	3	4	K	1	a		▲			Uses the coordinate plane to (2.4.K1a): list several ordered pairs on the graph of a line and find the slope of the line;					
8	3	4	K	1	b		▲			Uses the coordinate plane to (2.4.K1a): recognize that ordered pairs that lie on the graph of an equation are solutions to that equation;					
8	3	4	K	1	c		▲			Uses the coordinate plane to (2.4.K1a): recognize that points that do not lie on the graph of an equation are not solutions to that equation;					
8	3	4	K	1	d		▲			Uses the coordinate plane to (2.4.K1a): determine the length of a side of a figure drawn on a coordinate plane with vertices having the same x- or y-coordinates;					
8	3	4	K	1	e					Uses the coordinate plane to (2.4.K1a): solve simple systems of linear equations.					
8	3	4	K	2						Uses a given linear equation with integer coefficients and constants and an integer solution to find the ordered pairs, organizes the ordered pairs using a T-table, and plots the ordered pairs on a coordinate plane (2.4.K1e-g).					
8	3	4	K	3						Examines characteristics of two-dimensional figures on a coordinate plane using various methods including mental math, paper and pencil, concrete objects, and graphing utilities or other appropriate technology (2.4.A1g).					
8	3	4	A	1						Represents, generates, and/or solves distance problems (including the use of the Pythagorean theorem, but not necessarily the distance formula) (2.4.A1a), e.g., a student lives five miles west and three miles north of school and another student lives 4 miles south and 7 miles east of school. What is the shortest distance between the students' homes (as the crow flies)?					

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8	3	4	A	2						Translates between the written, numeric, algebraic, and geometric representations of a real-world problem (2.4.A1a,d-g), e.g., given a situation: make a T-table, define the algebraic relationship, and graph the ordered pairs. The T-table can be represented as – as an algebraic relationship – 2 χ = 5,					
8	4	1	K	1					$	Knows and explains the difference between independent and dependent events in an experiment, simulation, or situation (2.4.K1j).					
8	4	1	K	2						Identifies situations with independent or dependent events in an experiment, simulation, or situation (2.4.K1j), e.g., there are three marbles in a bag. If you draw one marble and give it to your brother, and another marble and give it to your sister, are these independent events or dependent events?					
8	4	1	K	3			▲			Finds the probability of a compound event composed of two independent events in an experiment, simulation, or situation (2.4.K1j), e.g., what is the probability of getting two heads, if you toss a dime and a quarter?					
8	4	1	K	4						Finds the probability of simple and/or compound events using geometric models (spinners or dartboards) (2.4.K1j).					
8	4	1	K	5						Finds the odds of a desired outcome in an experiment or simulation and expresses the answer as a ratio (2/3 or 2:3 or 2 to 3) (2.4.K1j).					
8	4	1	K	6						Describes the difference between probability and odds.					
8	4	1	A	1						Conducts an experiment or simulation with independent or dependent events including the use of concrete objects; records the results in a chart, table, or graph; and uses the results to draw conclusions and make predictions about future events (2.4.A1i-j).					

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8	4	1	A	2						Analyzes the results of an experiment or simulation of two independent events to generate convincing arguments, draw conclusions, and make predictions and decisions in a variety of real-world situations (2.4.A1i-j).					
8	4	1	A	3						Compares theoretical probability (expected results) with empirical probability (experimental results) in an experiment or simulation with a compound event composed of two independent events and understands that the larger the sample size, the greater the likelihood that the experimental results will equal the theoretical probability (2.4.A1i).					
8	4	1	A	4	a		▲ ■			Makes predictions based on the theoretical probability of (2.4.A1a,i): a simple event in an experiment or simulation,					
8	4	1	A	4	b					Makes predictions based on the theoretical probability of (2.4.A1a,i): compound events composed of two independent events in an experiment or simulation.					
8	4	2	K	1	a				$	Organizes, displays and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these data displays (2.4.K1k): frequency tables;					
8	4	2	K	1	b				$	Organizes, displays and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these data displays (2.4.K1k): bar, line, and circle graphs;					
8	4	2	K	1	c				$	Organizes, displays and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these data displays (2.4.K1k): Venn diagrams or other pictorial displays;					

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8	4	2	K	1	d				$	Organizes, displays and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these data displays (2.4.K1k): charts and tables;					
8	4	2	K	1	e				$	Organizes, displays and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these data displays (2.4.K1k): stem-and-leaf plots (single and double);					
8	4	2	K	1	f				$	Organizes, displays and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these data displays (2.4.K1k): scatter plots;					
8	4	2	K	1	g				$	Organizes, displays and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these data displays (2.4.K1k): box-and-whiskers plots;					
8	4	2	K	1	h				$	Organizes, displays and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these data displays (2.4.K1k): histograms.					
8	4	2	K	2						Recognizes valid and invalid data collection and sampling techniques.					
8	4	2	K	3			▲			Determines and explains the measures of central tendency (mode, median, mean) for a rational number data set (2.4.K1a).					
8	4	2	K	4						Determines and explains the range, quartiles, and interquartile range for a rational number data set (2.4.K1a).					

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8	4	2	K	5						Explains the effects of outliers on the median, mean, and range of a rational number data set (2.4.K1a).					
8	4	2	K	6						Makes a scatter plot and draws a line that approximately represents the data, determines whether a correlation exists, and if that correlation is positive, negative, or that no correlation exists (2.4.K1k).					
8	4	2	K	1	a				$	Uses data analysis (mean, median, mode, range) in real-world problems with rational number data sets to compare and contrast two sets of data, to make accurate inferences and predictions, to analyze decisions, and to develop convincing arguments from these data displays (2.4.A1j): frequency tables;					
8	4	2	K	1	b				$	Uses data analysis (mean, median, mode, range) in real-world problems with rational number data sets to compare and contrast two sets of data, to make accurate inferences and predictions, to analyze decisions, and to develop convincing arguments from these data displays (2.4.A1j): bar, line, and circle graphs;					
8	4	2	K	1	c				$	Uses data analysis (mean, median, mode, range) in real-world problems with rational number data sets to compare and contrast two sets of data, to make accurate inferences and predictions, to analyze decisions, and to develop convincing arguments from these data displays (2.4.A1j): Venn diagrams or other pictorial displays;					
8	4	2	K	1	d				$	Uses data analysis (mean, median, mode, range) in real-world problems with rational number data sets to compare and contrast two sets of data, to make accurate inferences and predictions, to analyze decisions, and to develop convincing arguments from these data displays (2.4.A1j): charts and tables;					

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8	4	2	K	1	e				$	Uses data analysis (mean, median, mode, range) in real-world problems with rational number data sets to compare and contrast two sets of data, to make accurate inferences and predictions, to analyze decisions, and to develop convincing arguments from these data displays (2.4.A1j): stem-and-leaf plots (single and double);					
8	4	2	K	1	f				$	Uses data analysis (mean, median, mode, range) in real-world problems with rational number data sets to compare and contrast two sets of data, to make accurate inferences and predictions, to analyze decisions, and to develop convincing arguments from these data displays (2.4.A1j): scatter plots;					
8	4	2	K	1	g				$	Uses data analysis (mean, median, mode, range) in real-world problems with rational number data sets to compare and contrast two sets of data, to make accurate inferences and predictions, to analyze decisions, and to develop convincing arguments from these data displays (2.4.A1j): box-and-whiskers plots;					
8	4	2	K	1	h				$	Uses data analysis (mean, median, mode, range) in real-world problems with rational number data sets to compare and contrast two sets of data, to make accurate inferences and predictions, to analyze decisions, and to develop convincing arguments from these data displays (2.4.A1j): 'histograms.					
8	4	2	K	2					$	Explains advantages and disadvantages of various data collection techniques (observations, surveys, or interviews), and sampling techniques (random sampling, samples of convenience, biased sampling, or purposeful sampling) in a given situation (2.4.A1j).					
8	4	2	K	3	a					Recognizes and explains (2.4.A1j): misleading representations of data;					
8	4	2	K	3	b					Recognizes and explains (2.4.A1j): the effects of scale or interval changes on graphs of data sets.					

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8	4	2	K	4						Recognizes faulty arguments and common errors in data analysis.					