

1. Arithmetic and Number Concepts/Operations

1. Student will develop number sense and the ability to represent numbers in a variety of forms and use numbers in diverse situations along with an understanding, selecting and applying various methods of performing numerical operations. R-(K-12)-3, W-(K-12) 6, 7, 8 OC(K-12)-1,2

I (Introduce), R (Reinforce/Expand), A (Apply)

The Student:	K	1	2	3	4	5	6	7	8	9	10	11	12
Demonstrates conceptual understanding of rational numbers with respect to: (N&O)-1													
<ul style="list-style-type: none"> • Whole numbers 0 to 12 through investigation that apply the concepts of equivalency in composing or decomposing numbers using models explanations 	A	A	A	A	A	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> • 0 to 100 using place value 		I	R	A	A	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> • In expanded notation 	R	A*	A	A	A	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> • 0 to 199 	I	R	A*	A	A	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> • 0 to 999 			I	R	A*	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> • 0 to 999,999 				I	R	A*	A	A	A	A	A	A	A
<ul style="list-style-type: none"> • 0 to 9, 999, 999 					I	R	A*	A	A	A	A	A	A
<ul style="list-style-type: none"> • Positive fractional numbers 													
<ul style="list-style-type: none"> ○ ½ as fair share 	A	A	A	A	A	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ a/2, a/3, a/4 (where a is a whole number greater than 0 and less than or equal to the denominator) as a part to whole relationships in area models where the denominator is equal to the number of parts in the whole 		I	A*	A	A	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ a/2, a/3, a/4, a/6, a/8 				I	R	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ a/5, a/6, a/8, a/10 					I	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ a/12 						I	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ decimals as part of 100 		I	R	A*	A	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ decimals as hundredths 			I	R	A*	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ decimals as tenths within the context of metric measurements 			I	R	A*	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ powers of 10 				I	R	A*	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ decimals (to thousandths) 				I	R	A*	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ benchmark percents 10%, 25%, 50%, 75%, 100% 				I	R	A*	A	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ ratios 					I	R	A*	A	A	A	A	A	A
<ul style="list-style-type: none"> ○ percents (as a means of comparing the same or different parts of the whole when the wholes vary in magnitude) 						I	R	A*	A	A	A	A	A

***Denotes first year tested**

Demonstrates conceptual understanding of rational numbers with respect to:	K	1	2	3	4	5	6	7	8	9	10	11	12
○ percents as a way of expressing multiples of a number						I	R	A*	A	A	A	A	A
○ square roots of perfect squares, rates & proportional reasoning						I	R	A*	A	A	A	A	A
○ absolute values							I	R	A	A	A	A	A
○ perfect squares & cube roots							I	R	A	A	A	A	A
○ percents as a way of describing change							I	R	A	A	A	A	A
○ rates					I	R	A*	A	A	A	A	A	A
Demonstrates understanding of the relative magnitude of numbers by ordering and comparing: (N&O)-2													
• 0 to 20	A	A	A	A	A	A	A	A	A	A	A	A	A
• 0 to 100		I	R	A	A	A	A	A	A	A	A	A	A
• 0 to 199	I	R	A*	A	A	A	A	A	A	A	A	A	A
• 0 to 999		I	R	A*	A	A	A	A	A	A	A	A	A
• 0 to 999,999			I	R	A*	A	A	A	A	A	A	A	A
• demonstrate one-to-one correspondence	A	A	A	A	A	A	A	A	A	A	A	A	A
• compare whole numbers to													
○ 5,10	A	A	A	A	A	A	A	A	A	A	A	A	A
○ 5,10, 25, 50, 75, 100	I	R	A	A	A	A	A	A	A	A	A	A	A
○ 125, 150, 175	I	R	A*	A	A	A	A	A	A	A	A	A	A
○ 250, 500, 750		I	R	A*	A	A	A	A	A	A	A	A	A
• ordering & comparing or identifying equivalent positive fractional numbers		I	R	A*	A	A	A	A	A	A	A	A	A
• or decimals			I	R	A*	A	A	A	A	A	A	A	A
• benchmark percents within number formats				I	R	A*	A	A	A	A	A	A	A
• integers				I	R	A*	A	A	A	A	A	A	A
• ordering or comparing numbers w/whole number bases & whole number exponents					I	R	A*	A	A	A	A	A	A
• rational numbers within & across number formats					I	R	A*	A	A	A	A	A	A
• whole number percents from 1-100 using number lines or equality & inequality symbols					I	R	A*	A	A	A	A	A	A
• absolute values						I	R	A*	A	A	A	A	A
• numbers represented in scientific notation (using number lines or equality or inequality symbols)						I	R	A*	A	A	A	A	A
• common irrational numbers (I)									I	R	A	A	A
• numbers w/fractional bases									I	R	A	A	A
• square roots									I	R	A	A	A

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Demonstrates understanding of the relative magnitude of numbers from: (cont.)	K	1	2	3	4	5	6	7	8	9	10	11	12
• rational bases with integer exponents									I	R	A*	A	A
• inequality by using:													
○ 1 more or less	A	A	A	A	A	A	A	A	A	A	A	A	A
○ 5 more, 5 less, 10 more, 10 less		I	R	A	A	A	A	A	A	A	A	A	A
○ 100 more, 100 less			I	R	A	A	A	A	A	A	A	A	A
• connecting number words (0 to 20)		I	R	A	A	A	A	A	A	A	A	A	A
• connecting numerals (0 to 100)	R	A	A	A	A	A	A	A	A	A	A	A	A
• connecting positions		I	R	A	A	A	A	A	A	A	A	A	A
Demonstrates conceptual understanding of mathematical operations through investigations involving addition & subtraction of: (N&O)-3													
• whole numbers 0 to 10	A	A	A	A	A	A	A	A	A	A	A	A	A
• 0 to 30		I	R	A	A	A	A	A	A	A	A	A	A
• By solving problems involving joining actions, separating actions part-part whole relationships, and comparison situations and addition of multiple one-digit whole numbers	I	R	A*	A	A	A	A	A	A	A	A	A	A
Demonstrates conceptual understanding of mathematical operations by: (N&O)-3													
• describing or illustrating the inverse relationship between addition and subtraction of whole numbers		I	R	A*	A	A	A	A	A	A	A	A	A
• relationship between repeated addition and multiplication using models, number lines or explanations		I	R	A*	A	A	A	A	A	A	A	A	A
• relationship between repeated subtraction and division (no remainders)			I	R	A*	A	A	A	A	A	A	A	A
• inverse relationship between multiplication & division of whole numbers			I	R	A*	A	A	A	A	A	A	A	A
• the addition or subtraction of positive fractional numbers with like denominators using models, number lines or explanations			I	R	A*	A	A	A	A	A	A	A	A
• describing or illustrating the meaning of a remainder w/respect to division of whole numbers using models, explanations or solving problems				I	R	A*	A	A	A	A	A	A	A
• describing or illustrating addition and subtraction of decimals						I	R	A	A	A	A	A	A
• positive proper fractions w/unlike denominators						I	R	A	A	A	A	A	A
• describing or illustrating the meaning of a power by representing the relationship between the base (whole number) and the exponent					I	R	A*	A	A	A	A	A	A
• the effect on the magnitude of a whole number when multiplying or dividing it by a whole number, decimal or fraction					I	R	A*	A	A	A	A	A	A
• addition and subtraction of positive fractions and integers					I	R	A*	A	A	A	A	A	A

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Demonstrates conceptual understanding of mathematical operations by:	K	1	2	3	4	5	6	7	8	9	10	11	12
• Multiplying and dividing fractions and decimals					I	R	A*	A	A	A	A	A	A
• With integers and whole number exponents								I	R	A	A	A	A
Accurately Solves Problems Involving: (N&O)-4													
• addition and subtraction w/regrouping		I	R	A	A	A	A	A	A	A	A	A	A
• concept of multiplication		I	R	A	A	A	A	A	A	A	A	A	A
• addition or subtraction of decimals (in the context of money)		I	R	A	A	A	A	A	A	A	A	A	A
• multiple operations on whole numbers			I	R	A*	A	A	A	A	A	A	A	A
• use of the properties of factors and multiples			I	R	A*	A	A	A	A	A	A	A	A
• addition or subtraction of decimals			I	R	A*	A	A	A	A	A	A	A	A
• addition or subtraction of positive proper fractions with like denominators			I	R	A*	A	A	A	A	A	A	A	A
• multiplication limited to 2 digits by 2 digits			I	R	A*	A	A	A	A	A	A	A	A
• division limited to 1 digit divisors			I	R	A*	A	A	A	A	A	A	A	A
• use of the properties of:													
o factors			I	R	A*	A	A	A	A	A	A	A	A
o multiples			I	R	A*	A	A	A	A	A	A	A	A
o prime				I	R	A*	A	A	A	A	A	A	A
o composite numbers				I	R	A*	A	A	A	A	A	A	A
• inverse relationships between addition/subtraction and multiplication/division						I	R	A*	A	A	A	A	A
• addition or subtraction of fractions (proper)				I	R	A*	A	A	A	A	A	A	A
• addition or subtraction of decimals to the hundredths place				I	R	A*	A	A	A	A	A	A	A
• division of whole number by up to a two-digit divisor				I	R	A*	A	A	A	A	A	A	A
• single or multiple operations on fractions (proper, improper & mixed)					I	R	A*	A	A	A	A	A	A
• single or multiple operations on decimals					I	R	A*	A	A	A	A	A	A
• addition or subtraction of integers					I	R	A*	A	A	A	A	A	A
• multiplication and division of integers					I	R	A*	A	A	A	A	A	A
• percent of a whole					I	R	A*	A	A	A	A	A	A
• greatest common factor					I	R	A*	A	A	A	A	A	A

***Denotes first year tested**

Accurately Solves Problems Involving (cont)	K	1	2	3	4	5	6	7	8	9	10	11	12
• least common multiple					I	R	A*	A	A	A	A	A	A
• proportional reasoning						I	R	A*	A	A	A	A	A
• percents involving discounts, tax, tips and rates						I	R	A*	A	A	A	A	A
• raising numbers to whole number powers								I	R	A	A	A	A
• determining square roots of perfect square numbers and non-perfect square numbers								I	R	A	A	A	A
• applies conventions of orders of operations						I	R	A*	A	A	A	A	A
• percent increase or decrease									I	R	A	A	A
• interest rates									I	R	A	A	A
• markups									I	R	A	A	A
• multiplication and division of squares									I	R	A	A	A
• multiplication and division of cubes									I	R	A	A	A
• taking square or cube roots									I	R	A	A	A
• involving proportions and percents across content strands, disciplines, and contexts									I	R	A*	A	A
○ compound percentages									I	R	A*	A	A
○ direct and inverse variation									I	R	A*	A	A
Demonstrates Understanding of Monetary Value by: (N&O)-5													
• Knowing the names and values for coins													
○ penny, nickel, dime	A	A	A	A	A	A	A	A	A	A	A	A	A
○ quarter		I	R	A	A	A	A	A	A	A	A	A	A
• adding collections of like coins together to a sum:													
○ no greater than \$1.00	R	A	A	A	A	A	A	A	A	A	A	A	A
○ no greater than \$1.99	I	R	A*	A	A	A	A	A	A	A	A	A	A
• making change from \$1.00 or less	I	R	A*	A	A	A	A	A	A	A	A	A	A
• recognizing equivalent coin representations of the same value up to \$1.99	I	R	A*	A	A	A	A	A	A	A	A	A	A
Mentally Calculates: (N&O)-6													
• naming the number that is one or one less	A	A	A	A	A	A	A	A	A	A	A	A	A
• naming the number that is one or two more or less		I	R	A	A	A	A	A	A	A	A	A	A
• naming the number that is 10 more or less			I	R	A	A	A	A	A	A	A	A	A
• facts to 10	R	A	A	A	A	A	A	A	A	A	A	A	A
• two-digit multiples of 10	I	R	A	A	A	A	A	A	A	A	A	A	A
• facts through 20			I	R	A	A	A	A	A	A	A	A	A

***Denotes first year tested**

Mentally Calculates: (N&O)-6 (cont.)	K	1	2	3	4	5	6	7	8	9	10	11	12
• adds two-digit and one-digit whole numbers				I	R	A	A	A	A	A	A	A	A
• adds combinations of two-digit and three-digit whole numbers that are multiples of ten				I	R	A	A	A	A	A	A	A	A
• adds 4-digits that are multiples of 100					I	R	A	A	A	A	A	A	A
• subtracts a one-digit from a two-digit				I	R	A	A	A	A	A	A	A	A
• subtracts two-digits that are multiples of ten				I	R	A	A	A	A	A	A	A	A
• subtracts three-digits that are multiples of 100				I	R	A	A	A	A	A	A	A	A
• multiplies facts to a product of 100					I	R	A	A	A	A	A	A	A
• calculates related division facts					I	R	A	A	A	A	A	A	A
• calculates multiplication and related division facts to a product of 144						I	R	A	A	A	A	A	A
• calculates change back from \$1.00, \$5.00 and \$10.00						I	R	A	A	A	A	A	A
• calculates change back from \$20.00, \$50.00, \$100.00							I	R	A	A	A	A	A
• multiplies a two-digit by a one-digit number						I	R	A	A	A	A	A	A
• multiplies two-digits that are multiples of ten						I	R	A	A	A	A	A	A
• multiplies a three-digit that is a multiple of 100 by a two-or-three-digit number which is a multiple of 10 to 100						I	R	A	A	A	A	A	A
• divides 3 and 4-digit multiples of powers of ten by their compatible factors						I	R	A	A	A	A	A	A
• any whole number percent between 0% and 100%									I	R	A*	A	A
• multiples of 100% up to 500%									I	R	A*	A	A
• related fractions as appropriate to a problem situation									I	R	A*	A	A
• determines the part of a whole number using benchmark percents:													
○ 1%, 10%, 25%, 50% and 75%							I	R	A	A	A	A	A
○ 33 1/3%, 66 2/3%, 100%								I	R	A	A	A	A
• benchmark perfect squares and related square roots								I	R	A	A	A	A
• determines part of a number using benchmark percents							I	R	A	A	A	A	A

***Denotes first year tested**

Makes Estimates by: (N&O)-7	K	1	2	3	4	5	6	7	8	9	10	11	12
• number of objects in a set													
○ 0 up to 20	A	A	A	A	A	A	A	A	A	A	A	A	A
○ 0 up to 30		I	R	A	A	A	A	A	A	A	A	A	A
○ 0 up to 50			I	R	A	A	A	A	A	A	A	A	A
• revising estimates as objects are counted	A	A	A	A	A	A	A	A	A	A	A	A	A
• evaluating reasonableness to solutions appropriate to grade level		I	R	A*	A	A	A	A	A	A	A	A	A
• determining level of accuracy of estimate				I	R	A*	A	A	A	A	A	A	A
• identifying when estimation is appropriate				I	R	A	A	A	A	A	A	A	A
• selecting the appropriate method of estimation				I	R	A	A	A	A	A	A	A	A
• evaluating the reasonableness of solutions appropriate to grade level GLEs across content strands				I	R	A	A	A	A	A	A	A	A
• determines the level of accuracy needed						I	R	A	A	A	A	A	A
• evaluating the reasonableness of solutions appropriate to GSEs across content strands									I	R	A*	A	A
• analyzing the effect of the estimation method on the accuracy of results						I	R	A	A	A	A	A	A
• in a given situation including:													
○ tips, discounts, tax								I	R	A	A	A	A
○ value of a non-perfect square root as between two whole numbers							I	R	A	A	A	A	A
Applies Properties of Numbers (N&O)-8													
• odd, even	R	A	A	A	A	A	A	A	A	A	A	A	A
• remainders			I	R	A*	A	A	A	A	A	A	A	A
• divisibility				I	R	A*	A	A	A	A	A	A	A
• prime factorization							I	R	A	A	A	A	A
• composition and decomposition	R	A	A	A	A	A	A	A	A	A	A	A	A
• remainders													
• field properties				I	R	A*	A	A	A	A	A	A	A
○ commutative and identity for addition	R	A	A	A	A	A	A	A	A	A	A	A	A
○ associative for addition			I	R	A	A	A	A	A	A	A	A	A
○ multiplicative property of zero for single-digits				I	R	A	A	A	A	A	A	A	A
○ multiplicative property of zero and remainders				I	R	A	A	A	A	A	A	A	A

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Applies Properties of Numbers (N&O)-8 (CONT)	K	1	2	3	4	5	6	7	8	9	10	11	12
○ divisibility						I	R	A	A	A	A	A	A
○ identity for multiplication				I	R	A	A	A	A	A	A	A	A
○ commutative for multiplication				I	R	A	A	A	A	A	A	A	A
○ distributive						I	R	A	A	A	A	A	A
○ multiplicative property of one							I	R	A	A	A	A	A
○ additive and multiplicative inverses to solve problems and to simplify computations							I	R	A	A	A	A	A
• demonstrates conceptual understanding of field properties as they apply to subsets of real numbers								I	R	A	A	A	A
○ commutative									I	R	A*	A	A
○ associative									I	R	A*	A	A
○ identity									I	R	A*	A	A
○ inverses									I	R	A*	A	A
• reflexive, symmetric, and transitive relations on sets of real numbers									I	R	A*	A	A
• when addition and multiplication are not defined in the traditional ways									I	R	A	A	A

***Denotes first year tested**

2. Geometry and Measurement

2. Students will develop spatial sense and an ability to use geometric properties and relationships to solve problems in mathematics and everyday life and will develop an understanding of and will use measurements to describe and analyze phenomena.

R-(K-12)-3 W(K-12) 6,7,8, OC(K-12)-1,2

I (Introduce), R (Reinforce/Expand), A (Apply)

The Student:	K	1	2	3	4	5	6	7	8	9	10	11	12
Uses properties, attributes, composition or decomposition to sort or classify polygons (G&M)-1													
• by a combination of two or more non-measurable or measurable attributes	I	K	A*	A	A	A	A	A	A	A	A	A	A
• recognizes names, builds and draws polygons		I	R	A	A	A	A	A	A	A	A	A	A
Uses properties or attributes of angles or sides (G&M)-1													
• number of sides or angles		I	R	A*	A	A	A	A	A	A	A	A	A
• length of sides		I	R	A*	A	A	A	A	A	A	A	A	A
• parallelism			I	R	A*	A	A	A	A	A	A	A	A
• perpendicularity			I	R	A*	A	A	A	A	A	A	A	A
• number of congruent sides				I	R	A*	A	A	A	A	A	A	A
• composition or decomposition of shapes		I	R	A*	A	A	A	A	A	A	A	A	A
To identify, describe or distinguish among (G&M)-1													
• triangles, squares, rectangles, rhombi, trapezoids, hexagons, or circles.		I	R	A*	A	A	A	A	A	A	A	A	A
• octagons			I	R	A*	A	A	A	A	A	A	A	A
• different types of triangles				I	R	A*	A	A	A	A	A	A	A
○ right, acute, obtuse, equiangular, equilateral				I	R	A*	A	A	A	A	A	A	A
○ scalene, isosceles					I	R	A*	A	A	A	A	A	A
• quadrilateral (rectangles, squares, rhombi, trapezoids, parallelograms)				I	R	A*	A	A	A	A	A	A	A
• classify angles relative to 90° as more than, or equal to			I	R	A*	A	A	A	A	A	A	A	A
Uses properties of angle relationships resulting from 2 or 3 intersecting lines						I	R	A*	A	A	A	A	A
• adjacent angles, vertical angles, straight angles						I	R	A*	A	A	A	A	A
• angle relationships formed by:													
○ two non-parallel lines cut by a transversal						I	R	A*	A	A	A	A	A
○ two parallel lines cut by a transversal to solve problems						I	R	A*	A	A	A	A	A

*Denotes first year tested

Applies theorems or relationships to solve problems (G&M)-2	K	1	2	3	4	5	6	7	8	9	10	11	12
• triangular inequality						I	R	A*	A	A	A	A	A
• sum of the measures of interior angles of regular polygons to solve problems						I	R	A*	A	A	A	A	A
Applies the Pythagorean Theorem (G&M)-2													
• to find a missing side of a right triangle or in problem solving situations									I	R	A	A	A
Uses The Attributes, Geometric Properties, Or Theorems Involving: (G&M) 10-2													
• angles									I	R	A	A	A
o vertical									I	R	A	A	A
o straight									I	R	A	A	A
o right									I	R	A	A	A
o complementary									I	R	A	A	A
o supplementary									I	R	A	A	A
o linear pair									I	R	A	A	A
o angle bisector									I	R	A	A	A
• lines									I	R	A	A	A
o parallel									I	R	A	A	A
o perpendicular									I	R	A	A	A
o skew									I	R	A	A	A
o mid-points on line									I	R	A	A	A
• polygons									I	R	A	A	A
• circles									I	R	A	A	A
• Pythagorean theorem									I	R	A	A	A
• triangle inequality theorem									I	R	A	A	A
• right triangle ratios									I	R	A	A	A
o sine									I	R	A	A	A
o cosine									I	R	A	A	A
o tangent									I	R	A	A	A
• solve problems									I	R	A	A	A
• justify solutions									I	R	A	A	A
Uses properties or attributes of: (G&M)-3													
• shapes of bases, number of lateral faces, number of bases				I	R	A*	A	A	A	A	A	A	A
• number of edges, number of vertices					I	R	A*	A	A	A	A	A	A
• find examples of objects in the environment that are of the same geometric shape.	R	A	A	A	A	A	A	A	A	A	A	A	A
• identify, compare or describe 3-dimensional shapes				I	R	A*	A	A	A	A	A	A	A

Uses properties or attributes of: (cont.)	K	1	2	3	4	5	6	7	8	9	10	11	12
○ rectangular prisms, triangular prisms, cylinders, spheres			I	R	A*	A	A	A	A	A	A	A	A
○ pyramids, cones				I	R	A*	A	A	A	A	A	A	A
Demonstrates conceptual understanding of congruency by: (G&M)-4													
• making mirror images and creating shapes that have line symmetry	R	A	A	A	A	A	A	A	A	A	A	A	A
• includes problems within mathematics and across disciplines and context using appropriate technology							I	R	R	R	A	A	A
• composing and decomposing:													
○ two dimensional			I	R	A	A	A	A	A	A	A	A	A
○ three dimensional				I	R	A	A	A	A	A	A	A	A
• uses line symmetry to demonstrate congruent parts within a shape.			I	R	A	A	A	A	A	A	A	A	A
• matching congruent figures using reflections, translation & rotations (flips, slides & turns)				I	R	A	A	A	A	A	A	A	A
• predicting and describing the transformational steps (including the degree of rotation)							I	R	A	A	A	A	A
• solving problems on a coordinate plane involving reflections, translations or rotations						I	R	A*	A	A	A	A	A
Demonstrates conceptual understanding of similarity by: (G&M)-5													
• identifying similar shapes		I	R	A	A	A	A	A	A	A	A	A	A
• applying scales on maps			I	R	A*	A	A	A	A	A	A	A	A
• reasons proportionally to interpret maps and to make smaller & larger scale drawings					I	R	R	A*	A	A	A	A	A
• applying characteristics of similar figures to identify similar figures			I	R	A*	A	A	A	A	A	A	A	A
• solving problems involving similar figures			I	R	A*	A	A	A	A	A	A	A	A
• describing relationships using models or explanations			I	R	A*	A	A	A	A	A	A	A	A
• describing the proportional effect on the linear dimensions of:													
○ triangles and rectangles when scaling up or down						I	R	A	A	A	A	A	A
○ polygons					I	R	A*	A	A	A	A	A	A
○ circles						I	R	A*	A	A	A	A	A
○ circles when the linear dimensions are multiplied by a constant factor						I	R	A*	A	A	A	A	A

***Denotes first year tested**

Demonstrates conceptual understanding of similarity by: (G&M)-5	K	1	2	3	4	5	6	7	8	9	10	11	12
• areas of polygons and circles when the linear dimensions are multiplied by a constant factor						I	R	A*	A	A	A	A	A
• determine the impact of scaling on the volume or surface area of 3-dimensional figures when linear dimensions are multiplied by a constant factor									I	R	A	A	A
• determine the length of sides of similar triangles									I	R	A	A	A
• solve problems involving growth and rate									I	R	A	A	A
• when linear and area measures are multiplied by a constant									I	R	A	A	A
• solving problems involving missing lengths and angles of polygons using similarity									I	R	A	A	A
• includes problems within mathematics and across disciplines and contexts using appropriate technology									I	R	A	A	A
Demonstrates conceptual understanding of : (G&M)-6													
• perimeter of polygons	I	R	A*	A	A	A	A	A	A	A	A	A	A
• area of:													
o rectangles on grids		I	R	A*	A	A	A	A	A	A	A	A	A
o circles						I	R	A	A	A	A	A	A
o polygons	I	R	A*	A	A	A	A	A	A	A	A	A	A
o triangles					I	R	A*	A	A	A	A	A	A
o right triangles				I	R	A*	A	A	A	A	A	A	A
o quadrilateral					I	R	A*	A	A	A	A	A	A
o irregular shapes on grids			I	R	A*	A	A	A	A	A	A	A	A
• using a variety of models, manipulatives or formulas			I	R	A*	A	A	A	A	A	A	A	A
• volume of:													
o rectangular prisms				I	R	A*	A	A	A	A	A	A	A
o triangular prisms						I	R	A*	A	A	A	A	A
o cylinders						I	R	A*	A	A	A	A	A
o pyramids							I	R	A*	A	A	A	A
o cones							I	R	A*	A	A	A	A
• circle measures					I	R	A*	A	A	A	A	A	A
• area or perimeter of composite figures						I	R	A*	A	A	A	A	A
• surface area of:													
o rectangular prisms						I	R	A*	A	A	A	A	A
o triangular prisms							I	R	A*	A	A	A	A
o cylinders									I	R	A	A	A

***Denotes first year tested**

Demonstrates conceptual understanding of : (G&M)-6 (cont)	K	1	2	3	4	5	6	7	8	9	10	11	12
○ pyramids									I	R	A	A	A
○ cones									I	R	A	A	A
• expresses all measures using appropriate units		I	R	A	A	A	A	A	A	A	A	A	A
• circumference of two dimensional figures									I	R	A	A	A
• problem solving situations on or off coordinate graph									I	R	A	A	A
Demonstrates conceptual understanding of measurable attributes using comparative language to describe and compare attributes of objects (G&M)-7													
• compares objects visually, with direct comparison and using non- standard units		I	R	A	A	A	A	A	A	A	A	A	A
• makes decisions concerning an appropriate degree of accuracy in problem situations involving measurement				I	I	R	A	A	A	A	A	A	A
• uses measurement conversion strategies (unit/dimensional analysis, quotient measures, product measures)					I	R	R	A	A	A	A	A	A
• applies informal concepts of successive approximation, upper and lower bounds, and limits in measurement situations.					I	R	R	A	A	A	A	A	A
Measures and uses units of measures appropriately and consistently, and makes conversions within systems when solving problems across the content strands (G&M)-7	I	R	A*	A	A	A	A	A	A	A	A	A	A
Determines elapsed and accurate time as it relates to: (G&M)-8													
• calendar patterns	R	A	A	A	A	A	A	A	A	A	A	A	A
• sequence of events in a day	A	A	A	A	A	A	A	A	A	A	A	A	A
• identifying a clock and calendar as measurement tools:													
○ days of the week	R	A	A	A	A	A	A	A	A	A	A	A	A
○ months of the year		I	R	A	A	A	A	A	A	A	A	A	A
• recognizes an hour & “on the ½ hour”		I	R	A	A	A	A	A	A	A	A	A	A
Demonstrates understanding of spatial relationships using location and position by: (G&M)-9													
• using positional words to locate and describe where an object is found in the environment	A	A	A	A	A	A	A	A	A	A	A	A	A
• using positional words to describe one location in reference to another on a map, in a diagram and in the environment		I	R	A	A	A	A	A	A	A	A	A	A
• using positional language in 2 & 3 dimensional situations to describe and interpret relative positions			I	R	A	A	A	A	A	A	A	A	A
• creates and interprets simple maps			I	R	A	A	A	A	A	A	A	A	A

Demonstrates understanding of spatial relationships using location and position by: (G&M)-9 (cont.)	K	1	2	3	4	5	6	7	8	9	10	11	12
• names locations on simple coordinate grids			I	R	A	A	A	A	A	A	A	A	A
• interpreting and giving directions from one location to another using positional words and between locations on a map or coordinate grid (first quadrant) using positional words or compass directions				I	R	A	A	A	A	A	A	A	A
• coordinate grid (all four coordinates)				I	R	A*	A	A	A	A	A	A	A
• plotting points in the first quadrant in context					I	R	A	A	A	A	A	A	A
• plotting points in all four quadrants in context						I	R	A	A	A	A	A	A
• finding the horizontal and vertical distances between points on a coordinate grid in the first quadrant					I	R	A	A	A	A	A	A	A
• solving problems on coordinate plane involving distance, midpoint, perpendicular and parallel lines and slope									I	R	A	A	A
• by sketching or using dynamic geometric software to generate three-dimensional objects or orthogonal view									I	R	A	A	A
• constructs or accurately represents and justifies the constructions or representations									I	R	A	A	A
o angle bisectors									I	R	A	A	A
o perpendicular lines									I	R	A	A	A
o congruent segments									I	R	A	A	A
o parallel lines									I	R	A	A	A
o regular polygons									I	R	A	A	A
o isosceles triangles									I	R	A	A	A
o inscribing and circumscribing									I	R	A	A	A
• use appropriate tools, coordinate geometry, dynamic geometric software and solving related problems									I	R	A	A	A
• identifying the vertices of polygons as they are reflected, rotated, and translated				I	R	A*	A	A	A	A	A	A	A

***Denotes first year tested**

Demonstrates conceptual understanding of spatial reasoning and visualization by: (G&M)-10	K	1	2	3	4	5	6	7	8	9	10	11	12
• copying, comparing and drawing models of:													
○ triangles, squares, rectangles, rhombi, trapezoids, hexagons, octagons			I	R	A*	A	A	A	A	A	A	A	A
• building models of rectangular prisms from two- or three- dimensional representations					I	R	A	A	A	A	A	A	A
• building models rectangular and triangular prisms, cones, cylinders and pyramids from 2 or 3 dimensional representations						I	R	A	A	A	A	A	A
• sketching 3-dimensional solids								I	R	A	A	A	A
• draws nets of rectangular and triangular prisms, cylinders, and pyramids and uses the nets as a technique for finding surface area								I	R	A	A	A	A
Uses units of measures appropriately and consistently, and makes conversions within systems when solving problems.			I	R	A	A	A	A	A	A	A	A	A

***Denotes first year tested**

3. Patterns, Functions, and Algebra

3. All students will develop an understanding of patterns, relationships, and functions and will use them to represent and explain real-world phenomena and will develop an understanding of algebraic concepts and processes and will use them to represent and analyze relationships among variable quantities and to solve problems. R(K-12)-3, R(K-12)-8 W(K-12) 6,7,8 OC-(K-12) 1,2

I (Introduce), R (Reinforce/Expand), A (Apply)

The Student:	K	1	2	3	4	5	6	7	8	9	10	11	12
Identifies and extends to specific cases a variety of patterns (linear and non-linear) represented in models, tables, sequences, graphs or problem situations by: (F&A)-1													
• extending the pattern to the next one	I	R	A	A	A	A	A	A	A	A	A	A	A
• extending the pattern to two or three elements		I	R	A*	A	A	A	A	A	A	A	A	A
• translating AB patterns across formats	I	R	A	A	A	A	A	A	A	A	A	A	A
• translating repeating patterns across formats	I	R	A	A	A	A	A	A	A	A	A	A	A
• identifying number patterns in the environment	I	R	A	A	A	A	A	A	A	A	A	A	A
• repeating and growing (numeric & non-numeric) represented in models, tables or sequences	I	R	A	A	A	A	A	A	A	A	A	A	A
• finding a missing element		I	R	A*	A	A	A	A	A	A	A	A	A
• writes a rule in words or symbols to find the next case			I	R	A*	A	A	A	A	A	A	A	A
• writes a rule in words or symbols for finding specific cases of a linear relationship				I	R	A*	A	A	A	A	A	A	A
• writes a rule in words or symbols for finding specific cases of a nonlinear relationship					I	R	A*	A	A	A	A	A	A
• writes an expression or equation using words or symbols to express the generalization of a linear relationship					I	R	A*	A	A	A	A	A	A
• generalizing a linear relationship to find a specific case						I	R	A*	A	A	A	A	A
• writes an expression or equation using words or symbols to express the generalization of a nonlinear relationship						I	R	A*	A	A	A	A	A
• generalizes a common nonlinear relationship to find a specific case									I	R	A	A	A
• in graphs					I	R	A*	A	A	A	A	A	A
• in problem situations				I	R	A*	A	A	A	A	A	A	A
Identifies and extends to specific cases a variety of patterns and functions (Linear and Non-linear) (F&A)-1													
• represented in models									I	R	A*	A	A
• represented in tables									I	R	A*	A	A
• represented in sequences									I	R	A*	A	A

* denotes first year it is tested

	K	1	2	3	4	5	6	7	8	9	10	11	12
• represented in graphs								I	R	A*	A	A	A
• represented in problem situations								I	R	A*	A	A	A
• expresses generalizations of linear relationships and functions as equations (non-recursive explicit equations)								I	R	A*	A	A	A
• expresses generalizations of non-linear relationships ($y=ax^2$, $y=b^n$)								I	R	A*	A	A	A
• expresses generalizations of relationship and functions as expressions or equations.								I	R	A*	A	A	A
• solves problems involving patterns within mathematics and across disciplines and contexts using appropriate technology								I	R	A*	A	A	A
• expresses generalizations of exponential (ab^n) patterns and functions as expressions or equations								I	R	A*	A	A	A
Demonstrates conceptual understanding of linear relationship($y=kx$) as a constant rate of change by: (F&A)-2													
• identifying, describing or comparing situations that represent constant rates of change					I	R	A	A	A	A	A	A	A
• constructing or interpreting graphs of real occurrences					I	R	A*	A	A	A	A	A	A
• describing the slope of linear relationships in a variety of problem situations					I	R	A*	A	A	A	A	A	A
• describing how change in the value of one variable relates to change in the value of a second variable in problem situations with constant rates of change					I	R	A*	A	A	A	A	A	A
• solving problems involving the relationship between slope and rate of change						I	R	A*	A	A	A	A	A
• informally determining the slope of a line from a table or graph						I	R	A*					
• informally and formally determining slopes and intercepts represented in graphs, tables or problem situations									I	R	A	A	A
• describing the meaning of slope in concrete situations						I	R	A*	A	A	A	A	A
• describing the meaning of slope and intercept in context							I	R	A*	A	A	A	A
• distinguishes between constant and varying rates of change in concrete situations represented in tables or graphs						I	R	A*	A	A	A	A	A
• distinguishes between linear relationships and nonlinear relationships represented in tables, graphs, equations or problem situations							I	R	A*	A	A	A	A
• describes how change in the value of one variable relates to change in the value of a second variable in problem situations with constant rates of change					I	R	A*	A	A	A	A	A	A
• varying rates of change					I	R	A*	A	A	A	A	A	A

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Demonstrates conceptual understanding of linear relationships and linear and non-linear functions (including $f(x)=ax^2$, $f(x)=b^x$, $f(x)=1x1$) (F&A)-2	K	1	2	3	4	5	6	7	8	9	10	11	12
• analyzes intercepts, domain, range, maximum and minimum values									I	R	A*	A	A
• analyzes constant and variable rates of change in mathematical and contextual situations									I	R	A*	A	A
• works flexibly between and among different representations of functions (graphs, tables, equations, and problem situations)									I	R	A*	A	A
• uses relations and functions to solve problems within mathematics and across disciplines and contexts using appropriate technology									I	R	A*	A	A
Demonstrates conceptual understanding of algebraic expressions by: (F&A)-3													
• using letters or symbols to represent unknown quantities to write simple linear algebraic expressions involving any one of the 4 operations			I	R	A*	A	A	A	A	A	A	A	A
• using letters or symbols to represent unknown quantities to write simple linear algebraic expressions involving any 2 of the 4 operations				I	R	A*	A	A	A	A	A	A	A
• using letters to represent unknown quantities to write linear algebraic expressions involving any of the four operations and consistent with order of operations expected at this grade level					I	R	A*	A	A	A	A	A	A
• evaluating simple linear algebraic expressions using whole numbers				I	R	A*	A	A	A	A	A	A	A
• evaluating linear algebraic expressions					I	R	A*	A	A	A	A	A	A
• includes those with more than one variable					I	R	A*	A	A	A	A	A	A
• evaluates an expression within an equation					I	R	A*	A	A	A	A	A	A
• including those with whole number exponents or more than one variable					A	I	R	A*	A	A	A	A	A
• by solving problems involving algebraic expressions (polynomial, rational, integer exponents, square roots, or absolute values)								I	R	A*	A	A	A
• by translating situations into algebraic expressions.					I	R	R	R	A*	A	A	A	A
• writing algebraic expressions (including those with whole numbers exponents or more than one variable)						I	R	A*	A	A	A	A	A

* denotes first year it is tested

3. (continued)	K	1	2	3	4	5	6	7	8	9	10	11	12
<ul style="list-style-type: none"> evaluates algebraic expressions including those with whole number exponents 						I	R	A*	A	A	A	A	A
<ul style="list-style-type: none"> simplifying algebraic expressions including those with square roots, whole number exponents, or rational numbers 									I	R	A	A	A
Demonstrates Conceptual Understanding of Equality by: (F&A)-4													
<ul style="list-style-type: none"> showing equivalence between two expressions using models or different representations of the expressions <ul style="list-style-type: none"> expressions consistent with the parameters of the left and right hand sides of the equations 		I	R	A*	A	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> finding the value that will make an open sentence true <ul style="list-style-type: none"> limited to one operation and limited to use addition or subtraction limited to one operation and limited to use addition, subtraction or multiplication 		I	R	A*	A	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> simplifying numerical expressions where left and right computations may be modified only by the use of parentheses 			I	R	A*	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> by solving one-step linear equations of the form $ax \neq c$, $x \neq b=c$, where a, b, & c are whole numbers with $a \neq 0$ 			I	R	A*	A	A	A	A	A	A	A	A
<ul style="list-style-type: none"> solving multi-step linear equations of the form $ax \neq b=c$ where a, b, & c are whole numbers with $a \neq 0$ 					I	R	A*	A	A	A	A	A	A
<ul style="list-style-type: none"> determining which values of a replacement set make the equation a true statement 				I	R	A*	A	A	A	A	A	A	A
<ul style="list-style-type: none"> translating a problem-solving situation into an equation consistent with the parameters of the type of equations being solved for this grade level 						I	R	A*	A	A	A	A	A
<ul style="list-style-type: none"> solving formulas for a variable requiring one transformation ($d=rt$; d/rt) 									I	R	A	A	A
<ul style="list-style-type: none"> solving multi-step linear equations with integer coefficients 									I	R	A	A	A
<ul style="list-style-type: none"> showing that two expressions are or are not equivalent by applying commutative, associative or distributive properties, order of operations or substitutions 									I	R	A	A	A
<ul style="list-style-type: none"> informally solving problems involving systems of linear equations in a context 									I	R	A	A	A
<ul style="list-style-type: none"> solving (symbolically and graphically) multi-step linear equations and inequalities and providing the meaning of the solutions 								I	R	A*	A	A	A
<ul style="list-style-type: none"> by solving quadratic equations and providing the meaning of the solutions. 								I	R	A*	A	A	A

3. Cont.	K	1	2	3	4	5	6	7	8	9	10	11	12
<ul style="list-style-type: none"> by solving problems that involve how a change in one variable affects the value of another variable (e.g., in $d=rt$ if the distance remains constant and time decreases, what happens to the rate?) 								I	R	A*	A	A	A
<ul style="list-style-type: none"> by solving problems involving systems of linear equations in a context (using equations or graphs) 								I	R	A*	A	A	A
<ul style="list-style-type: none"> by translating problem situations into equations or inequalities 								I	R	A*	A	A	A
<ul style="list-style-type: none"> by writing equivalent forms of formulas 								I	R	A*	A	A	A

* denotes first year it is tested

4. Data, Statistics and Probability

4. All students will develop an understanding of statistics and probability and will use them to describe sets of data, model situations and support appropriate inferences and arguments. R(K-12)-8, R(K-12)-3 W-(K-12) 6,7,8 OC(K-12) 1,2

I (Introduce), R (Reinforce/Expand), A (Apply)

The Student:	K	1	2	3	4	5	6	7	8	9	10	11	12
Interprets a given representation to answer questions related to the data using: (DSP-1)													
• models and tally charts created in the class	I	R	A*	A	A	A	A	A	A	A	A	A	A
• pictographs with one to one correspondence		I	R	A	A	A	A	A	A	A	A	A	A
• tables	I	R	A*	A	A	A	A	A	A	A	A	A	A
• line plots		I	R	A*	A	A	A	A	A	A	A	A	A
• bar graphs				I	R	A	A	A	A	A	A	A	A
• pictographs			I	R	A*	A	A	A	A	A	A	A	A
• circle graphs			I	R	A*	A	A	A	A	A	A	A	A
• line graphs				I	R	A*	A	A	A	A	A	A	A
• stem- and- leaf plots					I	R	A*	A	A	A	A	A	A
• scatter plots representing discrete linear relationships						I	R	A*	A	A	A	A	A
• histograms						I	R	A*	A	A	A	A	A
• scatter plots									I	R	A	A	A
• box-and –whisker plots									I	R	A	A	A
• frequency charts									I	R	A*	A	A
• words (verbal)	A	A	A	A	A	A	A	A	A	A	A	A	A
• diagrams	A	A	A	A	A	A	A	A	A	A	A	A	A
• scribed responses	A	A	A	A	A	A	A	A	A	A	A	A	A
• written responses		A	A	A	A	A	A	A	A	A	A	A	A
• justified conclusions			I	R	A*	A	A	A	A	A	A	A	A
• making predictions		I	R	A*	A	A	A	A	A	A	A	A	A
• critiquing of conclusions									I	R	A*	A	A
• solving problems			I	R	A*	A	A	A	A	A	A	A	A
○ within mathematics and across disciplines and contexts									I	R	A*	A	A

* denotes first year it is tested

The Student:	K	1	2	3	4	5	6	7	8	9	10	11	12
Analyzes data consistent with concepts and skills in DSP-2	A	A	A	A	A	A	A	A	A	A	A	A	A
Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using: (DSP-2)													
• more, less or equal	I	R	A*	A	A	A	A	A	A	A	A	A	A
• least or most (mode) frequent		I	R	A*	A	A	A	A	A	A	A	A	A
• largest or smallest		I	R	A*	A	A	A	A	A	A	A	A	A
• median			I	R	A*	A	A	A	A	A	A	A	A
• mode		I	R	A*	A	A	A	A	A	A	A	A	A
• range			I	R	A*	A	A	A	A	A	A	A	A
• mean				I	R	A*	A	A	A	A	A	A	A
• dispersion					I	R	A*	A	A	A	A	A	A
• outliers						I	R	A*	A	A	A	A	A
• quartile values									I	R	A	A	A
• estimated line of best fit									I	R	A	A	A
• problem solving				I	R	A*	A	A	A	A	A	A	A
• univariate and bivariate numerical data									I	R	A*	A	A
Demonstrates a Conceptual Understanding of: (DSP-2)													
• scatter plots or regression lines representing distribution of data									I	R	A*	A	A
○ informally estimating correlation coefficients as close to 1, -1, or 0									I	R	A*	A	A
○ provide explanations about the meaning of that value in context of data									I	R	A*	A	A
Evaluate sample space (DSP-2)													
• determine bias						I	R	A*	A	A	A	A	A
• random									I	R	A	A	A
• non-random									I	R	A	A	A
• from which statistics were developed									I	R	A*	A	A
Identifies or describes representations from DSP-1 that best display a given set of data or a situation (DSP-3)		I	R	A*	A	A	A	A	A	A	A	A	A
Organizes and displays data in the following formats with the purpose of answering questions, analyzing data to form conclusions, making predictions, justifying conclusions, and solving problems (DSP-3)													
• tables		I	R	A	A	A	A	A	A	A	A	A	A
• tally charts		I	R	A	A	A	A	A	A	A	A	A	A

Organizes and displays data in the following formats with the purpose of answering questions, analyzing data to form conclusions, making predictions, justifying conclusions, and solving problems (DSP-3) (cont.)	K	1	2	3	4	5	6	7	8	9	10	11	12
• bar graphs		I	R	A*	A	A	A	A	A	A	A	A	A
• line plots			I	R	A*	A	A	A	A	A	A	A	A
• pictographs			I	R	A*	A	A	A	A	A	A	A	A
• line graphs				I	R	A*	A	A	A	A	A	A	A
• stem and leaf plots					I	R	A*	A	A	A	A	A	A
• scatter plots								I	R	A	A	A	A
• circle graphs						I	R	A*	A	A	A	A	A
• parallel box									I	R	A*	A	A
• box and whisker plots									I	R	A*	A	A
• histograms									I	R	A*	A	A
• frequency distributions									I	R	A*	A	A

*denotes first year it is tested

The Student:	K	1	2	3	4	5	6	7	8	9	10	11	12
Uses counting techniques to solve problems involving combinations using a variety of strategies. (DSP-4)	I	R	A*	A	A	A	A	A	A	A	A	A	A
Uses counting techniques to solve problems involving: (DSP-4)													
• combinations and simple permutations		I	R	A*	A	A	A	A	A	A	A	A	A
Uses counting techniques to solve problems in context involving: (DSP-4)													
• combinations or simple permutations			I	R	A*	A	A	A	A	A	A	A	A
• fundamental counting principles					I	R	A*	A	A	A	A	A	A
• permutations								I	R	A	A	A	A
For a probability event in which the sample space may or may not contain equally likely outcomes. Students use experiments to: (DSP-5)													
• describes the likelihood of an event (chance) in general terms		A	A	A	A	A	A	A	A	A	A	A	A
• describes the likelihood of an event as certain or impossible			I	R	A	A	A	A	A	A	A	A	A
• determines theoretical probability expressed as a part to whole			I	R	A*	A	A	A	A	A	A	A	A
• determines theoretical probability expressed as a fraction				I	R	A*	A	A	A	A	A	A	A
• determines experimental probability expressed as a fraction				I	R	A*	A	A	A	A	A	A	A
• determines theoretical or experimental probability in problem solving situations					I	R	A*	A	A	A	A	A	A
• determines if a game is fair		I	R	A*	A	A	A	A	A	A	A	A	A
• geometric probability									I	R	A*	A	A
• expresses the result as a fraction, decimal, or percent									I	R	A*	A	A
• using simulations							I	R	A	A	A	A	A
• by comparing and contrasting theoretical and experimental probability								I	R	A	A	A	A
• by designing fair game							I	R	A	A	A	A	A
In response to a teacher or student generated questions/hypothesis students: (DSP-6)													
• decide the most effective method to collect numerical or categorical data			I	R	A	A	A	A	A	A	A	A	A
• collects, organizes, appropriately displays the data			I	R	A	A	A	A	A	A	A	A	A
• analyzes the data to draw conclusions about questions/hypothesis			I	R	A	A	A	A	A	A	A	A	A
• considers limitations that could affect interpretations								I	R	A	A	A	A
• makes predictions from data when appropriate			I	R	A	A	A	A	A	A	A	A	A
• asks new questions to real world situations					I	R	A	A	A	A	A	A	A
• decides most effective sampling techniques									I	R	A*	A	A

*denotes first year it is tested

5. Problem Solving and Reasoning

5. All students will develop the ability to pose and solve mathematical problems in mathematics, other disciplines, and everyday experiences and all students will develop reasoning ability and will become self-reliant, independent and mathematical thinkers.

R(K-12)-3 R(K-12)-8 W(K-12) 6,7,8 OC(K-12) 1,2 R(K-12)-12,13 R(5-12)-15

I (Introduce), R (Reinforce/Expand), A (Apply)

The Student:	K	1	2	3	4	5	6	7	8	9	10	11	12
Determines strategy	I	I	I	I	I	I	I	R	A	A	A	A	A
Determines materials	I	I	I	I	I	I	I	R	A	A	A	A	A
Analyzes Problem:													
*relationships			I	I	I	I	I	R	A	A	A	A	A
*relevant/irrelevant information			I	I	I	I	I	R	A	A	A	A	A
*sequencing/prioritizing				I	I	I	I	R	A	A	A	A	A
*patterns		I	I	I	I	I	I	R	A	A	A	A	A
Models problem	I	I	I	I	I	I	I	R	A	A	A	A	A
Determines when to break into simpler parts				I	I	I	I	R	A	A	A	A	A
Formulates conjectures based on problem				I	I	I	I	R	A	A	A	A	A
Solves Problem:													
*uses concrete objects	I	I	I	I	I	I	I	R	A	A	A	A	A
*uses pictorial representation	I	I	I	I	I	I	I	R	A	A	A	A	A
*makes calculations	I	I	I	I	I	I	I	R	A	A	A	A	A
*uses results of simpler problem				I	I	I	I	R	A	A	A	A	A
*uses mathematical notation/terms/clear language				I	I	I	I	R	A	A	A	A	A
*estimates solution graphically							I	R	A	A	A	A	A
Explains/Justifies Reasoning or Solution:													
*explains reasoning w/concrete objects	I	I	I	I	I	I	I	R	A	A	A	A	A
*explains reasoning w/pictorial representations	I	I	I	I	I	I	I	R	A	A	A	A	A
*explains reasoning using a variety of methods				I	I	I	I	R	A	A	A	A	A
*defends reasoning		I	I	I	I	I	I	R	A	A	A	A	A
*checks solution based on context	I	I	I	I	I	I	I	R	A	A	A	A	A
*justifies procedure used		I	I	I	I	I	I	R	A	A	A	A	A
*uses estimation to check			I	I	I	I	I	R	A	A	A	A	A
*defends solutions verbally and symbolically				I	I	I	I	R	A	A	A	A	A
*exact vs. estimated answers				I	I	I	I	R	A	A	A	A	A
Generalizes:													
*between problems		I	I	I	I	I	I	R	A	A	A	A	A

	K	1	2	3	4	5	6	7	8	9	10	11	12
*applies solution to similar problem				I	I	I	I	R	A	A	A	A	A
States/applies generalizations				I	I	I	I	R	A	A	A	A	A
Evaluates reasonableness in context of problem			I	I	I	I	I	R	A	A	A	A	A
Heuristic – learning through discovery		I	I	I	I	I	I	R	A	A	A	A	A
Strategies:													
*uses logical reasoning	I	I	I	I	I	I	I	R	A	A	A	A	A
*predicts and tests	I	I	I	I	I	I	I	R	A	A	A	A	A
*makes a table or graph	I	I	I	I	I	I	I	R	A	A	A	A	A
*finds a pattern	I	I	I	I	I	I	I	R	A	A	A	A	A
*draws a picture or diagram	I	I	I	I	I	I	I	R	A	A	A	A	A
*writes a number session		I	I	I	R	A	A	A	A	A	A	A	A
*works backward			I	I	I	I	I	R	A	A	A	A	A
*break a problem into simpler parts/solve a simpler problem			I	I	I	I	I	R	A	A	A	A	A
*makes a model or acts it out	I	I	I	I	I	I	I	R	A	A	A	A	A
*writes an equation					I	I	I	R	A	A	A	A	A
*makes an organized list			I	I	I	I	I	R	A	A	A	A	A
*chooses a strategy		I	I	I	I	I	I	R	A	A	A	A	A
Skills:													
*Identifies relationships			I	I	I	I	I	R	A	A	A	A	A
*Estimates or exact answer		I	I	I	I	I	I	R	A	A	A	A	A
*Sequences events				I	R	R	R	A	A	A	A	A	A
*Too much/Too little information			I	I	I	I	I	R	A	A	A	A	A
*Multi-step problems		I	I	I	I	I	I	R	A	A	A	A	A
*Chooses the operation	I	I	I	I	I	I	I	R	A	A	A	A	A
*Draws conclusions		I	I	I	I	I	I	R	A	A	A	A	A
*Interprets the remainder				I	I	I	I	R	A	A	A	A	A
*Uses a graph	I	I	I	I	I	I	I	R	A	A	A	A	A
*Makes generalizations				I	I	I	I	R	A	A	A	A	A
*Sequences information				I	I	I	I	R	A	A	A	A	A
*Evaluates reasonableness of answers		I	I	I	I	I	I	R	A	A	A	A	A
*Uses a table		I	I	R	R	R	R	A	A	A	A	A	A
*Uses a formula					I	I	I	R	A	A	A	A	A
*Makes decisions						I	I	R	A	A	A	A	A
*Sequences and prioritizes information						I	I	R	A	A	A	A	A
*Relevant or irrelevant information						I	I	R	A	A	A	A	A
Applications:													
*number sense	I	I	I	I	I	I	I	R	A	A	A	A	A

	K	1	2	3	4	5	6	7	8	9	10	11	12
*algebra and functions	I	I	I	I	I	I	I	R	A	A	A	A	A
*measurement and geometry	I	I	I	I	I	I	I	R	A	A	A	A	A
*statistics, data, analysis and probability	I	I	I	I	I	I	I	R	A	A	A	A	A
Critical Thinking & Logical Reasoning													
*classifies and sorts	I	I	I	I	I	I	I	R	A	A	A	A	A
*identifies, extends and uses patterns	I	I	I	I	I	I	I	R	A	A	A	A	A
*order and sequence	I	I	I	I	I	I	I	R	A	A	A	A	A
*makes generalizations		I	I	I	I	I	I	R	A	A	A	A	A
*compare and contrast	I	I	I	I	I	I	I	R	A	A	A	A	A
*draws conclusions		I	I	I	I	I	I	R	A	A	A	A	A
*uses logical reasoning	I	I	I	I	I	I	I	R	A	A	A	A	A
*makes & tests predictions	I	I	I	I	I	I	I	R	A	A	A	A	A
*explains and justifies answers	I	I	I	I	I	I	I	R	A	A	A	A	A
*evaluates evidence and conclusions				I	I	I	I	R	A	A	A	A	A
*interprets charts, tables and graphs	I	I	I	I	I	I	I	R	A	A	A	A	A
*checks reasonableness of results	I	I	I	I	I	I	I	R	A	A	A	A	A
Visual Thinking & Logical Reasoning:													
*spatial relationships	I	I	I	I	I	I	I	R	A	A	A	A	A
*visual patterns	I	I	I	I	I	I	I	R	A	A	A	A	A
*uses visual representations to solve problems	I	I	I	I	I	I	I	R	A	A	A	A	A
Decision Making:													
*decides when to estimate				I	I	I	I	R	A	A	A	A	A
*decides on a computation method			I	I	I	I	I	R	A	A	A	A	A
*decides whether answer is reasonable	I	I	I	I	I	I	I	R	A	A	A	A	A
*choose from options or alternatives		I	I	I	I	I	I	R	A	A	A	A	A
Creative Thinking:													
*solves non routine problems		I	I	I	I	I	I	R	A	A	A	A	A
*generates problems	I	I	I	I	I	I	I	R	A	A	A	A	A
*chooses alternative ways to solve problems		I	I	I	I	I	I	R	A	A	A	A	A
Communication:													
*drawing	I	I	I	I	I	I	I	R	A	A	A	A	A
*writing		I	I	I	I	I	I	R	A	A	A	A	A
*talking	I	I	I	I	I	I	I	R	A	A	A	A	A
Connections:													
*mathematical	I	I	I	I	I	I	I	R	A	A	A	A	A
*cross-curricular	I	I	I	I	I	I	I	R	A	A	A	A	A
*everyday	I	I	I	I	I	I	I	R	A	A	A	A	A

Multiple Representations:	K	1	2	3	4	5	6	7	8	9	10	11	12
*different manipulatives	I	I	I	I	I	I	I	R	A	A	A	A	A
*different models	I	I	I	I	I	I	I	R	A	A	A	A	A
*manipulatives, words and symbols	I	I	I	I	I	I	I	R	A	A	A	A	A
*models, words and symbols	I	I	I	I	I	I	I	R	A	A	A	A	A
*manipulatives and models	I	I	I	I	I	I	I	R	A	A	A	A	A
Tools:													
*calculator	I	I	I	I	I	I	I	R	A	A	A	A	A
*software	I	I	I	I	I	I	I	R	A	A	A	A	A
*manipulatives	I	I	I	I	I	I	I	R	A	A	A	A	A
*measuring tools	I	I	I	I	I	I	I	R	A	A	A	A	A
***ruler	I	I	I	I	I	I	I	R	A	A	A	A	A
***protractor					I	I	I	R	A	A	A	A	A
***compass					I	I	I	R	A	A	A	A	A