Grade 8 Math WKCE-CRT Alignment Worksheet

(January, 2005)

Objectives & Sub-skills	Descriptors, such as but not limited to …	Addressed in Grade 7	Addressed in Grade 8 by November 1
Students will effectively use mathematical knowledge, skills and strategies related to reasoning, communication, connections, representation and problem solving.			
Mathematical Processes			
	◆ Use reasoning and logic to perceive patterns, formulate questions, identify relationships, pose problems, make and test conjectures, and evaluate and justify strategies.		
	◆ *Communicate mathematical ideas and logical reasoning using the vocabulary of mathematics in a variety of ways e.g., using words, numbers, symbols, pictures, charts, tables, diagrams, graphs, and models.*		
	◆ Connect mathematics to the real world, as well as within mathematics.		
	◆ Create and use representations to organize, record, and communicate mathematical ideas.		
	◆ Solve and analyze routine and non-routine problems.		
Number Operations and Relationships			
Concepts	◆ *Recognize and apply place-value concepts to numbers less than 100,000,000 with decimals to the thousandths place.*		
	◆ *Read, write and represent numbers using words, numerals, number lines, arrays, and expanded form (12.09=10+2+.09) and symbolic renaming (12.09= 13-.91).*		
	◆ *Compare and order a set of fractions or decimals (to the hundredths place) and use symbols (<, >, =, ≠).*		
	◆ *Identify and use number theory concepts:* ○ *prime and composite numbers* ○ *divisibility potential of numbers (divisors of 1-10, 25, and multiples of 10).* ○ *least common multiples* ○ *greatest common factor of two numbers*		
	◆ Identify equivalent forms of fractions, decimals and percents.		
	◆ *Apply proportional reasoning to a variety of problem situations. (E.g. comparisons, rates, and similarities).*		
	◆ *Demonstrate understanding of fractions and percents with and without contexts (e.g.,sales tax and discounts, 40 is 25 percent of what number?; What number is 25 percent of 160?)*		

Text in red or italic is revised from the January, 2005 Math Framework.

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Computation	◆ Add and subtract mixed numbers and fractions with unlike denominators, multiply mixed numbers.		
	◆ *Use all operations in everyday situations to solve single or multi-step word problems.*		
	◆ Divide decimals (up to hundredths) and integers (-100 to 100) in problems with and without context; demonstrate understanding of the concept of division of fractions in a contextual setting.		
	◆ Solve problems involving percents e.g., 75 percent of 200 is __; 150 is __percent of 200 *with and without context.*		
	◆ *Add and subtract decimals including thousandths with and without text.*		
	◆ *Multiply decimals and integers (-100 to 100) including thousandths with and without context. (Ex. interest rates)*		
	◆ Estimate the sum, difference and product of whole numbers, common fractions, mixed numbers and decimals to thousandths.		
	◆ Determine reasonableness of answers.		
Geometry			
Describing figures	◆ Name 3-dimensional figures e.g., rectangular prisms, square pyramids, cones, cylinders and spheres.		
	◆ Find the measure of the third angle of a triangle when given the measures of two interior or exterior angles.		
	◆ Determine the sum of the angles of a polygon using diagonals drawn from one vertex.		
	◆ Determine the measure of an angle in a drawing of an adjacent and supplementary or adjacent and complementary pair of angles when given the measure of the other angle.		
Spatial relationships and transformations	◆ Identify figures that are congruent and/or similar.		
	◆ Describe 3-dimensional shapes from multiple perspectives.		
	◆ Draw and/or describe a similar figure when given a polygon drawn on graph paper with vertices at lattice points.		
	◆ Demonstrate understanding of similarity by finding the relationship between the sides of two figures.		
	◆ *Draw or identify the image of a figure based on one or more transformations (reflection, rotation and/or translation).*		
	◆ *Design symmetrical shapes.*		
	◆ *Draw or identify lines of symmetry.*		

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	◆ Classify figures possessing line symmetry only; line and rotation symmetry; rotational symmetry only; no symmetry.		
	◆ *Identify and describe 3-dimensional figures from multiple perspectives.*		
Coordinate systems	◆ *Identify, locate, plot coordinates in all four quadrants; draw or identify the reflection of a point across the x- or y-axis or the translation of a point at integer coordinates in any of the four quadrants.*		
	◆ Locate or plot coordinates in any of the four quadrants using a geometric context.		
Measurement			
Measurable attributes	◆ Approximate conversions of units between metric and U.S. customary systems using a model or in context (quart/liter; yard/meter).		
	◆ *Convert units within a system e.g., feet to yards; ounces to pounds; inches to feet; pints to quarts.*		
	◆ Select the appropriate unit of measure (U.S. customary and metric) to estimate the length and mass/weight of everyday objects.		
Direct measurement	◆ Measure and/or draw angles up to 360 degrees.		
	◆ *Determine and compare elapsed time in problem-solving situations.*		
	◆ Apply appropriate tools, techniques and formulas to measure to the nearest 1/4-, 1/8- or 1/16-inch or nearest centimeter or millimeter.		
Indirect measurement	◆ Draw similar figures in any shape using a scale factor e.g., enlarge/shrink.		
	◆ Determine the actual distance between three points using a scale.		
	◆ Determine perimeter/circumference and area of triangles, circles and parallelograms with and without context.		
	◆ Determine volume and surface area of cylinders, rectangular prisms and pyramids (with bases of triangle, square, pentagon and hexagon) in real-world context.		
	◆ Use D = rt formula in simple contexts.		
	◆ Estimate area given a reference.		
	◆ Use ratio and proportion in context.		

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Statistics and Probability			
Data analysis and statistics	◆ Extract, interpret and analyze data including multiple representations of the same data from tables, double back-to-back stem-and-leaf plots, double bar graphs, simple circle graphs, line plots, line graphs, charts and diagrams with and without context.		
	◆ Compare two sets of data to generate or confirm/deny a hypotheses.		
	◆ Find mean, median (with odd or even number of data), mode and range of a set of data with and without context. without context.		
	◆ Create graph with one-variable data sets using back-to-back stem-and-leaf plots, double bar graphs, circle graphs, line plots and line graphs; discuss appropriateness of graph selected.		
	◆ *Compare two sets of data to generate or confirm/deny hypotheses.*		
	◆ Evaluate sources of data in context and multiple representations of a give data set.		
Probability	◆ Determine the likelihood of an event and probability based on one or two dependent or independent events.		
	◆ Use data from simulations provided in charts/tables to solve and interpret probability problems.		
	◆ *Determine the number of arrangements from a set of 5 or less. Ex: How many different ways could 5 students stand in line?*		
	◆ Solve problems involving sample spaces or diagrams.		
	◆ Use probabilities to estimate outcomes and evaluate fair and unfair simple events.		
	◆ Analyze outcomes based on an understanding of theoretical and experimental probability.		
Algebraic Relationships			
Patterns, relations and functions	◆ Describe and analyze in words functional relationships in two concurrent numeric patterns using multiplication and exponents.		
	◆ *Use two concurrent numeric patterns to describe and analyze functional relationships between two variables.*		
	◆ Extend an increasing or decreasing arithmetic or geometric pattern.		

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	◆ Justify the accuracy of the chosen item in a sequence.		
	◆ Identify the rule to complete or extend a function table or any combination of the two using one or two operations (+, -, x, ÷) and numbers (-100 through 100) in the function table.		
	◆ Describe and interpret linear patterns in tables and graphs.		
	◆ Describe real-world phenomena that a given graph might represent.		
Expressions, equations and inequalities	◆ Solve single-variable two-step equations with whole number, *whole number integer, or rational, coefficients with and without context.*		
	◆ Solve single-variable inequalities using symbols.		
	◆ Find values of expressions with one variable and up to two operations including basic operations and exponents.		
	◆ *Solve two-step multi-operation equations with letter variables and whole number or integer coefficients with and without context.*		
	◆ Write an algebraic expression (with one or two operations) which generalizes a linear pattern.		
	◆ Create a corresponding algebraic expression when given an arithmetic operation/relationship expressed in words.		
	◆ Evaluate formulas with and without context by solving for a specified variable.		
Properties	◆ Identify a pair of equivalent numerical or one-variable expressions when using commutative or associative properties with addition and multiplication.		
	◆ Demonstrate understanding of up to four-step order of operations using parentheses, exponents and fraction symbol.		
	◆ Demonstrate understanding of distributive property without variables.		
	◆ Solve order of operations problems with one variable to demonstrate understanding of commutativity and associativity.		