2010 ACOS MATHEMATICS/ARMT+ SPECIFICATIONS CORRELATION

GRADE 5

2010 ACOS		ARMT+ Specifications					
CURRENT GRADE 5 CONTENT		2003 CONTENT STANDARD		ITEM TYPE	POINTS POSS.	ADDITIONAL INFORMATION	PAGES IN ITEM SPECS
5.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. [5-OA1]						
5.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. [5-OA2]	5.7	Write a number sentence for a problem expressed in words.	Multiple-choice	4	• Word problems/real-life situations may be used. • Up to seven-digit numbers may be used. • Money values may be used. • A box may be used. • A variable may be used.	pp. 39-43
5.3	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. [5-OA3]	5.9	Identify components of the Cartesian plane, including the x-axis, y-axis, origin, and quadrants.	Open-ended	3	• Word problems/real-life situations will be used. • All parts must be labeled. • Axis will be drawn in answer box.	pp. 52-58
5.4	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. [5-NBT1]	5.1	Demonstrate number sense by comparing, ordering, rounding, and expanding whole numbers through millions and decimals to thousandths.	Multiple-choice	4	• Word problems/real-life situations may be used. • Tables and charts may be used. • In comparing numbers, *greater than*, *greatest, less than*, or *least* may be used (symbols or words). • In comparing numbers, *greatest* to *least* or *least to greatest* may be used. • In rounding numbers, *closest* or *nearer* may be used.	pp. 5-8
5.5	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. [5-NBT2]	5.1	Demonstrate number sense by comparing, ordering, rounding, and expanding whole numbers through millions and decimals to thousandths.	Multiple-choice	4	• Word problems/real-life situations may be used. • Tables and charts may be used. • In comparing numbers, *greater than*, *greatest, less than*, or *least* may be used (symbols or words). • In comparing numbers, *greatest* to *least* or *least to greatest* may be used. • In rounding numbers, *closest* or *nearer* may be used.	pp. 5-8

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5.6 5.6a 5.6b	Read, write, and compare decimals to thousandths. [NBT3] a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). [5-NBT3a] b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. [5-NBT3b]	5.1	Demonstrate number sense by comparing, ordering, rounding, and expanding whole numbers through millions and decimals to thousandths.	Multiple-choice	4	• Word problems/real-life situations may be used. • Tables and charts may be used. • In comparing numbers, *greater than*, *greatest, less than*, or *least* may be used (symbols or words). • In comparing numbers, *greatest* to *least* or *least to greatest* may be used. • In rounding numbers, *closest* or *nearer* may be used.	pp. 5-8
5.7	Use place value understanding to round decimals to any place. [5-NBT4]	5.1	Demonstrate number sense by comparing, ordering, rounding, and expanding whole numbers through millions and decimals to thousandths.	Multiple-choice	4	• Word problems/real-life situations may be used. • Tables and charts may be used. • In comparing numbers, *greater than*, *greatest, less than*, or *least* may be used (symbols or words). • In comparing numbers, *greatest* to *least* or *least to greatest* may be used. • In rounding numbers, *closest* or *nearer* may be used.	pp. 5-8
5.8	Fluently multiply multi-digit whole numbers using the standard algorithm. [5-NBT5]						
5.9	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. [5-NBT6]						
5.10	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. [5-NBT7]	5.1	Solve word problems that involve decimals, fractions, or money.	Multiple-choice Open-ended	9	• Word problems/real-life situations may be used. • Tables and charts may be used. • Multiple steps may be used. • Fractions may or may not need to be in their simplest form.	pp. 18-26
5.11	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. [5-NF1]	5.4	Determine the sum and difference of fractions with common and uncommon denominators.	Multiple-choice Gridded	6	• No word problems/real-life situations will be used. • Bare computational problems will be used. • Mixed numbers may be used. • Reducing fractions may be required.	pp. 27-30

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5.12	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. [5-NF2]	5.4	Determine the sum and difference of fractions with common and uncommon denominators.	Multiple-choice Gridded	6	• No word problems/real-life situations will be used. • Bare computational problems will be used. • Mixed numbers may be used. • Reducing fractions may be required.	pp. 27-30
5.13	Interpret a fraction as division of the numerator by the denominator (*a*/*b* = *a* ÷ *b*.) Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. [5-NF3]	5.4	Determine the sum and difference of fractions with common and uncommon denominators.	Multiple-choice Gridded	6	• No word problems/real-life situations will be used. • Bare computational problems will be used. • Mixed numbers may be used. • Reducing fractions may be required.	pp. 27-30
5.14 5.14a 5.14b	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. [5-NF4] a. Interpret the product (*a*/*b*) × *q* as *a* parts of a partition of *q* into *b* equal part equivalently, as the result of a sequence of operations *a* × *q* ÷ *b*. [5-NF4a] b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. [5-NF4b]	5.3	Solve word problems that involve decimals, fractions, or money.	Multiple-choice Open-ended	9	• Word problems/real-life situations may be used. • Tables and charts may be used. • Multiple steps may be used. • Fractions may or may not need to be in their simplest form.	pp. 18-26
		5.11	Estimate perimeter and area of irregular shapes using unit squares and grid paper.	Multiple-choice	3	• No word problems/real-life situations will be used. • Graphics will be used. • Shapes will be shown using grid paper and unit squares. • In estimating perimeter and area, *closest* may be used.	pp. 63-66
5.15 5.15a 5.15b	Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. [5-NF5a] b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence *a*/*b* = (*n*×*a*)/(*n*×*b*) to the effect of multiplying *a*/*b* by 1. [5-NF5b]						

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5.16	**Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. [5-NF6]**						
5.17 5.17a 5.17b 5.17c	**Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.) [5-NF7] a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. [5-NF7a] b. Interpret division of a whole number by a unit fraction, and compute such quotients. [5-NF7b] c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. [5-NF7c]**						
5.18	**Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. [5-MD1]**	**5.13**	**Convert a larger unit of measurement to a smaller unit of measurement within the same system (customary or metric).**	**Multiple-choice Gridded**	**4**	**• Word problems/real-life situations may be used. • Conversion units will not be provided. • Each conversion will be within the same system.**	**pp. 71-75**
5.19	**Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8.) Use operations on fractions for this grade to solve problems involving information presented in line plots. [5-MD2]**						
5.20 5.20a 5.20b	**Recognize volume as an attribute of solid figures and understand concepts of volume measurement. [5-MD3] a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. [5-MD3a] b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units. [5-MD3b] c.**						
5.21	**Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. [5-MD4]**						

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5.22 5.22a 5.22b 5.22c	**Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. [5-MD5]** **a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. [5-MD5a]** **b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. [5-MD5b]** **c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems. [5-MD5c]**						
5.23	**Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate). [5-G1]**	5.9	Identify components of the Cartesian plane, including the x-axis, y-axis, origin, and quadrants.	Open-ended	3	• Word problems/real-life situations will be used. • All parts must be labeled. • Axis will be drawn in answer box.	pp. 52-58
5.24	**Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. [5-G2]**	5.9	Identify components of the Cartesian plane, including the x-axis, y-axis, origin, and quadrants.	Open-ended	3	• Word problems/real-life situations will be used. • All parts must be labeled. • Axis will be drawn in answer box.	pp. 52-58
5.25	**Understand that attributes belonging to a category of two–dimensional figures also belong to all subcategories of that category. [5-G3]**	5.8	Identify regular polygons and congruent polygons.	Multiple-choice	3	• No word problems/real-life situations will be used. • Graphics will be used. • Length of sides and measures of angles will be given. • Right angles will be noted. • One of the two congruent polygons may be rotated.	pp. 44-51

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5.26	Classify two-dimensional figures in a hierarchy based on properties. [5-G4]	5.8	Identify regular polygons and congruent polygons.	Multiple-choice	3	• No word problems/real-life situations will be used. • Graphics will be used. • Length of sides and measures of angles will be given. • Right angles will be noted. • One of the two congruent polygons may be rotated.	pp. 44-51

Additional Standards that Must Be Addressed for ARMT+

	2003 CONTENT STANDARD		ITEM TYPE	POINTS POSS.	ADDITIONAL INFORMATION	PAGES IN ITEM SPECS
	5.2	Solve problems involving basic operations on whole numbers, including addition and subtraction of seven-digit numbers, multiplication with two-digit multipliers, and division with two- digit divisors.	Multiple-choice Gridded Open-ended	6	• Word problems/real-life situations may be used. • Tables and charts may be used. • Fractions will not be used. • Multiple steps may be used. • Money values may be used. • Remainders may be used.	pp. 9-17
	5.5	Identify numbers less than zero by extending the number line.	Multiple-choice	3	• Word problems/real-life situations may be used. • A number line may be used. • A thermometer may be used.	pp. 31-34
	5.6	Demonstrate the commutative, associative, and identity properties of addition and multiplication of whole numbers.	Multiple-choice	4	• No word problems/real-life situations will be used. • Multiple steps may be required. • Parentheses may be used.	pp. 35-38
	5.10	Identify the center, radius, and diameter of a circle.	Multiple-choice	2	• No word problems/real-life situations will be used. • Graphics will be used.	pp. 59-62
	5.12	Calculate the perimeter of rectangles from measured dimensions.	Multiple-choice Gridded	3	• No word problems/real-life situations will be used. • Graphics may be used. • Measured dimensions will be given. • Metric or customary units will be used.	pp. 67-70

Additional Standards that Must Be Addressed for ARMT+

	2003 CONTENT STANDARD		ITEM TYPE	POINTS POSS.	ADDITIONAL INFORMATION	PAGES IN ITEM SPECS
	5.14	Analyze data collected from a survey or experiment to distinguish between what the data show and what might account for the results.	Multiple-choice Open-ended	5	• Word problems/real-life situations will be used. • Tables and charts may be used. • Time may be used.	pp. 76-88
	5.15	Use common fractions to represent the probability of events that are neither certain nor impossible	Multiple-choice Gridded	4	• Word problems/real-life situations will be used. • Tables and charts may be used. • Graphics may be used. • Answers will never be certain (100%) or never (0%). • Answers for gridded items will be expressed in fractions. • Answers and distracters for multiple-choice items will be fractions. • Reducing fractions may be required.	pp. 89-93