# 2010 ACOS MATHEMATICS/ARMT+ SPECIFICATIONS CORRELATION

## GRADE 3

| 2010 ACOS | | ARMT+ Specifications | | | | | |
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| CURRENT GRADE 3 CONTENT | | 2003 CONTENT STANDARD | | ITEM TYPE | POINTS POSS. | ADDITIONAL INFORMATION | PAGES IN ITEM SPECS |
| 3.1 | Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. [3-OA1] | | | | | | |
| 3.2 | Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. [3-OA2] | | | | | | |
| 3.3 | Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem (See Appendix A, Table 2.) [3-OA3] | | | | | | |
| 3.4 | Determine the unknown whole number in a multiplication or division equation relating three whole numbers. [3-OA4] | 3.3 | Multiply whole numbers with and without regrouping using single-digit multipliers. | Multiple-choice | 4 | • No word problems/real-life situations will be used.<br>• Bare computational problems will be used.<br>• One- to three-digit multiplicands will be used.<br>• Regrouping may be required. | pp. 16-17 |
| | | 3.4 | Divide whole numbers using two-digit dividends and one-digit divisors. | Multiple-choice | 4 | • No word problems/real-life situations will be used.<br>• Bare computational problems will be used.<br>• No remainders will be used. | pp. 18-19 |
| 3.5 | Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) [3-OA5] | | | | | | |
| 3.6 | Understand division as an unknown-factor problem. [3-OA6] | | | | | | |

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| 3.7 | Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. [3-OA7] | 3.3 | Multiply whole numbers with and without regrouping using single-digit multipliers. | Multiple-choice | 4 | • No word problems/real-life situations will be used.<br>• Bare computational problems will be used.<br>• One- to three-digit multiplicands will be used.<br>• Regrouping may be required. | pp. 16-17 |
| | | 3.4 | Divide whole numbers using two-digit dividends and one-digit divisors. | Multiple-choice | 4 | • No word problems/real-life situations will be used.<br>• Bare computational problems will be used.<br>• No remainders will be used. | pp. 18-19 |
| 3.8 | Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).) [3-OA8] | | | | | | |
| 3.9 | Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. [3-OA9] | 3.7 | Complete a given numeric or geometric pattern. | Multiple-choice<br><br>Open-ended | 6 | • Word problems/real-life situations may be used.<br>• Tables and charts may be used.<br>• Graphics may be used. | pp. 42-50 |
| 3.10 | Use place value understanding to round whole numbers to the nearest 10 or 100. [3-NBT1] | | | | | | |
| 3.11 | Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. [3-NBT2] | 3.2 | Solve addition and subtraction problems, including word problems, involving two- and three-digit numbers with and without regrouping. | Multiple-choice<br><br>Open-ended | 9 | • Word problems/real-life situations may be used.<br>• Tables and charts may be used.<br>• Multiple steps may be used.<br>• Time may be used. | pp. 8-15 |
| 3.12 | Multiply one-digit whole numbers by multiples of 10 in the range 10 - 90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations. [3-NBT3] | 3.3 | Multiply whole numbers with and without regrouping using single-digit multipliers. | Multiple-choice | 4 | • No word problems/real-life situations will be used.<br>• Bare computational problems will be used.<br>• One- to three-digit multiplicands will be used.<br>• Regrouping may be required. | pp. 16-17 |

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| 3.13 | Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts and size 1/b. [3-NF1] | 3.5 | Model equivalent fractions with concrete objects or pictorial representations. | Multiple-choice | 4 | • Graphics will be used.<br>• Items will give fraction and graphic display.<br>• Reasonable denominators will be used. | pp. 20-28 |
| 3.14<br>3.14a<br>3.14b | Understand a fraction as a number on the number line; represent fractions on a number line diagram. [3-NF2]<br>a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. [3-NF2a]<br>b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. [3-NF2b] | | | | | | |
| 3.15<br>3.15a<br>3.15b<br>3.15c<br>3.15d | Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. [3-NF3]<br>a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. [3-NF3a]<br>b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3.) Explain why the fractions are equivalent, e.g., by using a visual fraction model. [3-NF3b]<br>c. Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers.[3-NF3c]<br>d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. [3-NF3d] | 3.5 | Model equivalent fractions with concrete objects or pictorial representations. | Multiple-choice | 4 | • Graphics will be used.<br>• Items will give fraction and graphic display.<br>• Reasonable denominators will be used. | pp. 20-28 |
| 3.16 | Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. [3-MD1] | 3.11 | Determine elapsed time to the day with calendars and to the hour with a clock. | Multiple-choice | 3 | • Word problems/real-life situations may be used.<br>• Graphics will be used.<br>• Analog and digital clocks will be used. | pp. 72-75 |

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| 3.17 | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (Excludes compound units, such as cm3 and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (Excludes multiplicative comparison problems (problems involving notions of 'times as much'; see Appendix A, Table 2). [3-MD2] | | | | | | |
| 3.18 | Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step 'how many more' and 'how many less' problems using information presented in scaled bar graphs. [3-MD3] | | | | | | |
| 3.19 | Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters. [3-MD4] | 3.10 | Measure length in metric units. | Multiple-choice | 3 | • Word problems/real-life situations may be used.<br>• Length will be measured to the nearer centimeter. | pp. 67-71 |
| 3.20<br>3.20a<br>3.20b | Recognize area as an attribute of plane figures and understand concepts of area measurement. [3-MD5]<br>a. A square with side length 1 unit called 'a unit square,' is said to have 'one square unit' of area, and can be used to measure area. [3-MD5a]<br>b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. [3-MD5b] | | | | | | |
| 3.21 | Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units). [3-MD6] | | | | | | |

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| **3.22**<br>**3.22a**<br>**3.22b**<br>**3.22c**<br>**3.22d** | **Relate area to the operations multiplication and addition.[3-MD7]**<br>**a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. [3-MD7a]**<br>**b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. [3-MD7b]**<br>**c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a x b and a x c. Use area models to represent the distributive property in mathematical reasoning. [3-MD7c]**<br>**d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. [3-MD7d]** | | | | | | |
| **3.23** | **Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. [3-MD1]** | | | | | | |
| **3.24** | **Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides) and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. [3-G1]** | | | | | | |
| **3.25** | **Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. [3-G2]** | **3.5** | **Model equivalent fractions with concrete objects or pictorial representations.** | **Multiple-choice** | **4** | • **Graphics will be used.**<br>• **Items will give fraction and graphic display.**<br>• **Reasonable denominators will be used.** | **pp. 20-28** |

# Additional Standards That Must Be Addressed for ARMT+

| | | 2003 CONTENT STANDARD | | ITEM TYPE | POINTS POSS. | ADDITIONAL INFORMATION | PAGES IN ITEM SPECS |
|---|---|---|---|---|---|---|---|
| | | 3.1 | Demonstrate number sense by comparing, ordering, and expanding whole numbers through 9999. | Multiple-choice | 4 | • Word problems/real-life situations may be used.<br>• Tables and charts may be used.<br>• In comparing numbers, *greater than, less than, greatest, least, more than,* or *between* may be used.<br>• | pp. 4-7 |
| | | 3.6 | Use coins to make change up to $1.00. | Multiple-choice<br><br>Open-ended | 5 | • Word problems/real-life situations may be used.<br>• Graphics will be used. | pp. 29-41 |
| | | 3.8 | Identify geometric representations for points, lines, perpendicular lines, parallel lines, angles, and rays. | Multiple-choice | 4 | • Word problems/real-life situations may be used.<br>• Graphics will be used. | pp. 51-55 |
| | | 3.9 | Specify locations on a coordinate grid by using horizontal and vertical movements. | Multiple-choice<br><br>Open-ended | 6 | • Word problems/real-life situations may be used.<br>• Graphics will be used.<br>• Direction must be specified using up, down, left, right or north, south, east, west. | pp. 56-66 |
| | | 3.12 | Recognize data as either categorical or numerical. | Multiple-choice | 3 | • The terms categorical and numerical will not be used. | pp. 76-79 |
| | | 3.13 | Determine the likelihood of different outcomes in a simple experiment. | Multiple-choice | 3 | • Word problems/real-life situations may be used.<br>• Tables and charts may be used.<br>• Graphics will be used.<br>• In determining the likelihood, *most likely*, *least likely*, *certain*, *possible*, and *impossible* may be used. | pp. 80-83 |