4th Grade MCA3 Standards, Benchmarks, Test Specifications & Sampler Questions

	Standard	No.	Benchmark (4th Grade)	Sampler Item
Number & Operation **MCA III 18 – 22 Items**	Demonstrate mastery of multiplication and division basic facts; multiply multi-digit numbers; solve real-world and mathematical problems using arithmetic. **MCA III 8 – 10 Items**	4.1.1.1	Demonstrate fluency with multiplication and division facts. *Item Specifications* • Factors are limited to 1–9 • Vocabulary allowed in items: quotient **"and vocabulary given at previoius grades" (& vgapg).**	There are 35 students going on a class trip. The students ride in vans. There are 7 students riding in each van. How many vans are needed to take all the students? **A.** 4 **B.** 5 **C.** 6 **D.** 7
		4.1.1.2	Use an understanding of place value to multiply a number by 10, 100 and 1000. *Item Specifications* • Numbers multiplied by 10, 100 and 1000 may contain at most, 2 digits • Numbers must be whole numbers • Vocabulary allowed in items: vgapg	A truck has 50 boxes of jump ropes. Each box contains 100 jump ropes. How many jump ropes are on the truck? **A.** 50 **B.** 500 **C.** 5,000 **D.** 50,000
		4.1.1.3	Multiply multi-digit numbers, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms. *Item Specifications* • Items will contain multiplication of a one- or two-digit number by a two- or three-digit number • Numbers must be whole numbers • Items must not have context • Vocabulary allowed in items: factor & vgapg.	Multiply. 406 × 58 Type your answer in the box. Two numbers are multiplied together. 724 × 8□ = 62,264 Which digit goes in the box? **A.** 0 **B.** 1 **C.** 4 **D.** 6
		4.1.1.4	Estimate products and quotients of multi-digit whole numbers by using rounding, benchmarks and place value to assess the reasonableness of results. *For example*: 53 × 38 is between 50 × 30 and 60 × 40, or between 1500 and 2400, and 411/73 is between 5 and 6. *Item Specifications* * Assessed within 4.1.1.5	No Sampler Item
		4.1.1.5	Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of technology, and the context of the problem to assess the reasonableness of results. *Item Specifications* • Solutions must be less than 100,000 • Vocabulary allowed in items: operation, strategy, solve & vgapg.	A camping group bought 15 sleeping bags that cost $42 each and a tent that cost $160. What was the total cost of the sleeping bags and the tent? **A.** $217 **B.** $630 **C.** $790 **D.** $2,442

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		4.1.1.6	Use strategies and algorithms based on knowledge of place value, equality and properties of operations to divide multi-digit whole numbers by one- or two-digit numbers. Strategies may include mental strategies, partial quotients, the commutative, associative, and distributive properties and repeated subtraction. *For example*: A group of 324 students is going to a museum in 6 buses. If each bus has the same number of students, how many students will be on each bus? *Item Specifications* • Dividend may contain at most, 3 digits • Vocabulary allowed in items: quotient, divisor, dividend & vgapg.	Divide. $908 \div 4$ **A.** 202 **B.** 212 **C.** 227 **D.** 247
	Represent and compare fractions and decimals in real-world and mathematical situations; use place value to understand how decimals represent quantities. **MCA III** **10 – 12 Items**	4.1.2.1	Represent equivalent fractions using fraction models such as parts of a set, fraction circles, fraction strips, number lines and other manipulatives. Use the models to determine equivalent fractions. *Item Specifications* • Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12 • Vocabulary allowed in items: equivalent, represent, numerator, denominator & vgapg.	A fraction model is shown.  Which shows an equivalent fraction? **A.**  **B.**  **C.**  **D.**  Color the rectangle to model the fraction $\frac{1}{3}$. Click on the parts you want to color. 
		4.1.2.2	Locate fractions on a number line. Use models to order and compare whole numbers and fractions, including mixed numbers and improper fractions. *For example*: Locate $\frac{5}{3}$ and $1\frac{3}{4}$ on a number line and give a comparison statement about these two fractions, such as "$\frac{5}{3}$ is less than $1\frac{3}{4}$." *Item Specifications* • Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12 • Vocabulary allowed in items: equivalent, numerator, denominator, improper fraction, mixed numbers, compare & vgapg.	Which point is shown at $\frac{2}{3}$?  **A.** *W* **B.** *X* **C.** *Y* **D.** *Z*

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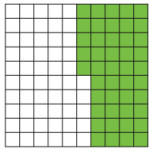
		4.1.2.3	Use fraction models to add and subtract fractions with like denominators in real-world and mathematical situations. Develop a rule for addition and subtraction of fractions with like denominators. *Item Specifications* • Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12 • Vocabulary allowed in items: numerator, denominator & vgapg.	Jason has 8 cupcakes.  He eats $\frac{1}{8}$ of the cupcakes and gives $\frac{2}{8}$ of the cupcakes to his friends. What fraction of the cupcakes are left? A. $\frac{1}{8}$ B. $\frac{3}{8}$ C. $\frac{5}{8}$ D. $\frac{3}{5}$
		4.1.2.4	Read and write decimals with words and symbols; use place value to describe decimals in terms of thousands, hundreds, tens, ones, tenths, hundredths and thousandths. *For example*: Writing 362.45 is a shorter way of writing the sum: 3 hundreds + 6 tens + 2 ones + 4 tenths + 5 hundredths, which can also be written as: three hundred sixty-two and forty-five hundredths. *Item Specifications* • Vocabulary allowed in items: decimal & vgapg.	In the number 200.358, which digit is in the hundredths place? A. 2 B. 3 C. 5 D. 8
		4.1.2.5	Compare and order decimals and whole numbers using place value, a number line and models such as grids and base 10 blocks. *Item Specifications* • Numbers used are from thousands to thousandths • Allowable symbols: < and > • Vocabulary allowed in items: decimal & vgapg.	A decimal number is shown on a grid.  Which number is less than the number shown on the grid? A. 0.9 B. 0.48 C. 0.450 D. 0.275
		4.1.2.6	Read and write tenths and hundredths in decimal and fraction notations using words and symbols; know the fraction and decimal equivalents for halves and fourths. *For example*: $\frac{1}{2}$ = 0.5 = 0.50 and $\frac{7}{4}$ = $1\frac{3}{4}$ = 1.75, which can also be written as one and three-fourths or one and seventy-five hundredths. *Item Specifications* • Vocabulary allowed in items: decimal, equivalent & vgapg.	Which fraction is equivalent to 0.23? A. $\frac{1}{23}$ B. $\frac{23}{10}$ C. $\frac{23}{100}$ D. $\frac{2}{3}$

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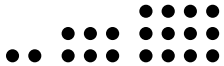
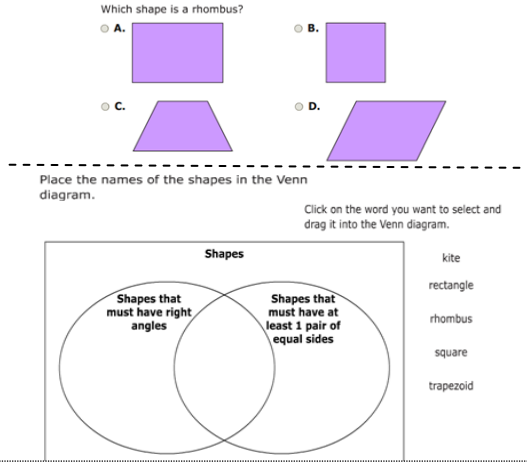
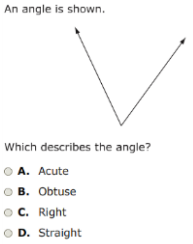
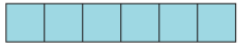
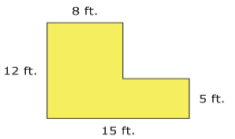
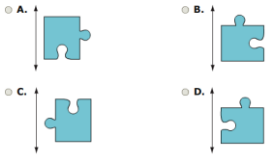
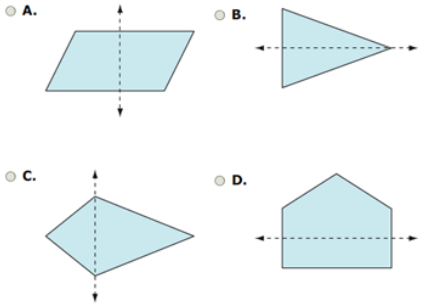
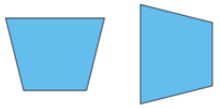
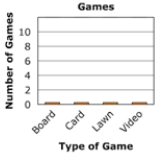
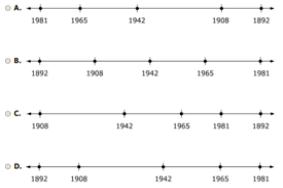
		4.1.2.7	Round decimals to the nearest tenth. *For example*: The number 0.36 rounded to the nearest tenth is 0.4. *Item Specifications* • Numbers must be less than 500 • Decimals may be given up to thousandths • Vocabulary allowed in items: decimal & vgapg.	What is 9.582 rounded to the nearest tenth? ○ **A.** 9.5 ○ **B.** 9.58 ○ **C.** 9.6 ○ **D.** 10
Algebra **MCA III** **8 – 10 Items**	Use input-output rules, tables and charts to represent patterns and relationships and to solve real-world and mathematical problems. **MCA III** **4 – 5 Items**	4.2.1.1	Create and use input-output rules involving addition, subtraction, multiplication and division to solve problems in various contexts. Record the inputs and outputs in a chart or table. *For example*: If the rule is "multiply by 3 and add 4," record the outputs for given inputs in a table. *Another example*: A student is given these three arrangements of dots:  Identify a pattern that is consistent with these figures, create an input-output rule that describes the pattern, and use the rule to find the number of dots in the 10th figure. *Item Specifications* • When creating a rule from pairs, 3 input-output pairs must be given; pairs are not required to be consecutive • Output should not exceed 100 • Vocabulary allowed in items: vgapg	A table is shown. f | g 4 | 2 8 | 4 16 | 8 What rule was used to make the table? ○ **A.** $g = 2f$ ○ **B.** $g = \frac{f}{2}$ ○ **C.** $g = f + 2$ ○ **D.** $g = 2f + 2$
	Use number sentences involving multiplication, division and unknowns to represent and solve real-world and mathematical problems; create real-world situations corresponding to number sentences. **MCA III** **4 – 5 Items**	4.2.2.1	Understand how to interpret number sentences involving multiplication, division and unknowns. Use real-world situations involving multiplication or division to represent number sentences. *For example*: The number sentence $a \times b = 60$ can be represented by the situation in which chairs are being arranged in equal rows and the total number of chairs is 60. *Item Specifications* • Numbers must be less than 100 • Variables, boxes or blanks may be used to represent unknown numbers • Vocabulary allowed in items: variable & vgapg.	Which equations are true when $n = 12$? Click on the equations you want to select. $3 \times n = 15$ $6 \times n = 2$ $n \div 4 = 3$ $48 \div n = 4$ $2 \times n = 24 + 2$ An equation is shown. $12 \_\_\_\_ 5 = 17 + 43$ Which symbol makes the equation true? ○ **A.** + ○ **B.** – ○ **C.** × ○ **D.** ÷
		4.2.2.2	Use multiplication, division and unknowns to represent a given problem situation using a number sentence. Use number sense, properties of multiplication, and the relationship between multiplication and division to find values for the unknowns that make the number sentences true. *For example*: If \$84 is to be shared equally among a group of children, the amount of money each child receives can be determined using the number sentence $84 \div n = d$. *Another example*: Find values of the unknowns that make each number sentence true: $12 \times m = 36$ $s = 256 \div t$. *Item Specifications* • Numbers must be less than 100 • Variables, boxes or blanks may be used to represent unknown numbers • Vocabulary allowed in items: variable & vgapg.	Robert has 54 pencils. He has 1 box of pencils and 3 packages of pencils. The box has 24 pencils. Which equation can be used to find p, the number of pencils in each package? ○ **A.** $p = 54 + 3 \times 24$ ○ **B.** $24 = 54 + 3 \times p$ ○ **C.** $54 = 3 + 24 \times p$ ○ **D.** $54 = 24 + 3 \times p$

Strand	Standard	No.	Benchmark (4th Grade)	Sample Item
Geometry & Measurement **MCA III 12 – 15 Items**	Name, describe, classify and sketch polygons. **MCA III 4 – 5 Items**	4.3.1.1	Describe, classify and sketch triangles, including equilateral, right, obtuse and acute triangles. Recognize triangles in various contexts. *Item Specifications* • Naming of triangles is limited to equilateral, right, obtuse and acute • Allowable notation: 90º • Vocabulary allowed in items: vertex & vgapg.	Which statement is true about an obtuse triangle? **A.** It has 2 acute angles. **B.** It has 2 obtuse angles. **C.** It can be a right triangle. **D.** It can be an acute triangle.
		4.3.1.2	Describe, classify and draw quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms and kites. Recognize quadrilaterals in various contexts. *Item Specifications* • Naming of quadrilaterals is limited to quadrilateral, square, rectangle, trapezoid, rhombus, parallelogram and kite • Allowable notation: 90º • Vocabulary allowed in items: vertex, congruent, & vgapg.	
	Understand angle and area as measurable attributes of real-world and mathematical objects. Use various tools to measure angles and areas. **MCA III**	4.3.2.1	Measure angles in geometric figures and real-world objects with a protractor or angle ruler. *Item Specifications* • Not assessed on the MCA-III	No Sampler Item
		4.3.2.2	Compare angles according to size. Classify angles as acute, right and obtuse. *For example*: Compare different hockey sticks according to the angle between the blade and the shaft. *Item Specifications* • Allowable notation: 90º, angle arc • Vocabulary allowed in items: vgapg.	

	5 – 7 Items	4.3.2.3	Understand that the area of a two-dimensional figure can be found by counting the total number of same size square units that cover a shape without gaps or overlaps. Justify why length and width are multiplied to find the area of a rectangle by breaking the rectangle into one unit by one unit squares and viewing these as grouped into rows and columns. *For example*: How many copies of a square sheet of paper are needed to cover the classroom door? Measure the length and width of the door to the nearest inch and compute the area of the door. *Item Specifications* • Vocabulary allowed in items: area, & vgapg.	Kira is using 1-inch square tiles to cover a table top. The table top is 24 inches long and 18 inches wide. She lays the tiles into strips of 6.  How many strips of tiles will Kira need to cover the table with no gaps or overlaps? **A.** 14 **B.** 18 **C.** 72 **D.** 432
		4.3.2.4	Find the areas of geometric figures and real-world objects that can be divided into rectangular shapes. Use square units to label area measurements. *Item Specifications* • Vocabulary allowed in items: area, & vgapg.	The shape of a floor is shown.  What is the area of the floor? **A.** 40 sq. ft. **B.** 131 sq. ft. **C.** 171 sq. ft. **D.** 180 sq. ft.
	Use translations, reflections and rotations to establish congruency and understand symmetries. **MCA III** **3 – 4 Items**	4.3.3.1	Apply translations (slides) to figures. *Item Specifications* • Vocabulary allowed in items: translation, reflection, rotation, symmetry, congruent, transformation, image, & vgapg.	A shape is shown.  Which shows a translation of the shape over the line? 
		4.3.3.2	Apply reflections (flips) to figures by reflecting over vertical or horizontal lines and relate reflections to lines of symmetry. *Item Specifications* • Vocabulary allowed in items: translation, reflection, rotation, symmetry, congruent, vertical, horizontal, transformation, image, & vgapg.	Which shows a line of symmetry? 

		4.3.3.3	Apply rotations (turns) of 90˚ clockwise or counterclockwise. *Item Specifications* • Vocabulary allowed in items: translation, reflection, rotation, symmetry, congruent, clockwise, counterclockwise, transformation, image, & vgapg.	A figure is shown.  Which shows a 90° counterclockwise rotation of the figure? A.  B.  C.  D. 
		4.3.3.4	Recognize that translations, reflections and rotations preserve congruency and use them to show that two figures are congruent. *Item Specifications* • Vocabulary allowed in items: translation, reflection, rotation, symmetry, congruent, transformation, image, & vgapg.	Ron draws a trapezoid, then rotates it 90°.  Which statement is true about the 2 trapezoids? A. They are congruent because all trapezoids are congruent. B. They are congruent because rotating a trapezoid does not change its size and shape. C. They are not congruent because rotating the trapezoid changes its side lengths. D. They are not congruent because rotating the trapezoid changes its angle measures.
Data Analysis **MCA III** **6 – 8 Items**	Collect, organize, display and interpret data, including data collected over a period of time and data represented by fractions and decimals. **MCA III** **6 – 8 Items**	4.4.1.1	Use tables, bar graphs, timelines and Venn diagrams to display data sets. The data may include fractions or decimals. Understand that spreadsheet tables and graphs can be used to display data. *Item Specifications* • Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12 • Decimals are limited to hundredths • When interpreting data, displays may include tables, bar graphs, timelines, Venn diagrams, line plots and pictographs • Vocabulary allowed in items: timeline, Venn diagram, survey, & vgapg.	Rita counted the number of different types of games she has. Games Type of Game / Number of Games Board 4 Card 6 Lawn 5 Video 3 Use the information in the table to complete the bar graph. Click on the bar graph where the top of each bar should be.  A student creates a time line for a history project. Which shows a time line?  A pictograph shows the number of animals Jeff saw at a farm. Farm Animals Type of Animal / Number of Animals Cow Goat Horse Pig = 4 animals How many horses did Jeff see? Type your answer in the box.