

*Mathematics*  
*Grade 4*

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Item Types	Cognitive Levels	Calculator	Strand II – Number Sense	Item Totals
			Sub-strand A. Number Sense	By Strand
			Standard: Represent whole numbers in various ways to quantify information and to solve real-world and mathematical problems. Understand the concept of fractions and decimals.	By Sub-strand
			<b>Benchmarks</b>	17 – 19
				By Sub-strand
				6 – 8
				By Benchmark
MC	A	CN	<b>II.A.1</b> Students will read and write whole numbers to 100,000. <i>Content Limit:</i> Whole numbers must be less than or equal to 100,000.	1 – 2
MC	A	CN	<b>II.A.2</b> Students will compare and order whole numbers. <i>Content Limit:</i> Whole numbers must be less than or equal to 100,000. When comparing numbers, mathematical symbols will not be used for greater than or less than. When ordering a set of numbers, no more than four values are used. Numbers may be ordered least to greatest or greatest to least.	1 – 2
MC	A B C	NC	<b>II.A.3</b> Students will use fractions and decimals to solve real-world or mathematical problems. <i>Content Limit:</i> Fraction denominators are limited to 2, 3, 4, 6 and 8. Items involving decimals may include money as a context. Items are limited to representation problems (e.g., compare and order). No computation problems are included in items. Items will contain either fractions or decimals, but not both.	2 – 3

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<b>MC</b>	<b>A</b> <b>B</b>	<b>NC</b>	<p><b>II.A.4</b> Students will use rounding and estimation to solve real-world or mathematical problems. <i>Content Limit:</i> Whole numbers must be less than 1,000. Computation is not required. Items may require comparison or order within an item. Items may require choosing among various options of rounding numbers to obtain an estimation, but not determining final estimation. (e.g., <math>56 + 51</math> rounded to <math>60 + 50</math>)</p>	2 – 3
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Item Types	Cognitive Levels	Calculator	Strand II – Number Sense	Item Totals
			Sub-strand B. Computation and Operation	By Strand
			Standard: Compute fluently and make reasonable estimates with whole numbers in real-world and mathematical problems. Understand the meanings of arithmetic operations and how they relate to one another.	<i>continued</i>
			Benchmarks	By Sub-strand
				10 – 12
				By Benchmark
MC or CR	A B C	CL	<b>II.B.1</b> Students will use addition and subtraction to solve real-world or mathematical problems. <i>Content Limit:</i> Addition items may contain at most three whole number addends. Sums are less than or equal to 10,000. Both numbers in subtraction must be less than 10,000. Items can be multi-step. Items can combine addition and subtraction in same item.	2 – 4
			<b>II.B.2</b> Students will add. <i>Content Limit:</i> Items may contain at most three whole numbers. Each addend contains at most three digits. Items may be in vertical or horizontal format.	1 – 2
			<b>II.B.3</b> Students will subtract. <i>Content Limit:</i> Whole numbers only are used. Each number contains at most three digits. Items may be in vertical or horizontal format. Differences must be greater than 0. Items are limited to one step.	1 – 2

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<b>MC</b>	<b>A</b>	<b>NC</b>	<p><b>II.B.4</b> Students demonstrate mastery of multiplication facts. <i>Content Limit:</i> Factors are limited to 0 – 10. Items may include number sentences.</p>	1 – 2
<b>MC or CR</b>	<b>A B C</b>	<b>CL</b>	<p><b>II.B.5 and II.B.6</b> Students will use multiplication and division to solve simple real-world and mathematical problems. <i>Content Limit:</i> Whole numbers only are used. Each factor may contain at most two digits. Division items may involve only a one-digit divisor. Division items may involve at most a two-digit dividend. Items cannot require multiplication and division in same item. Items may require the use of a variety of strategies such as the inverse relationship of multiplication and division to compute and check results.</p>	2 – 3
<b>MC</b>	<b>A</b>	<b>NC</b>	<p><b>II.B.7</b> Students will multiply single digit multiples of powers of ten mentally. <i>Content Limit:</i> Items may require student knowledge of multiplication facts through 9 X 9. Items may include number sentences. Examples would include 300 X 60 or 70 X 3. Items do not include 310 X 4. Answer options may include mental strategies.</p>	0 – 1

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Item Types	Cognitive Levels	Calculator	<b>Strand III – Patterns, Functions and Algebra</b>	
			<b>Item Totals</b>	
			<b>By Strand</b>	
			6 – 7	
		<b>Sub-strand A. Patterns and Functions</b>		
		Standard: Understand and describe patterns in tables and graphs.		
		<b>Benchmarks</b>		
		<b>By Benchmark</b>		
<b>MC or CR</b>	<b>A B C</b>	<b>CN</b>	<p><b>III.A.1</b> Students will describe patterns in tables and graphs.</p> <p><i>Content Limit:</i> In a repeating pattern, the pattern will be repeated three times (stem plus two). In a MC repeating pattern, items do not require identification of more than four terms beyond what is given. In a growing or shrinking pattern, the first four terms must be given. In a MC growing or shrinking pattern, items do not require identification of more than four terms beyond what is given. The largest value of any term provided or in an answer option is 100. The operations in growing or shrinking patterns are limited to addition, subtraction and multiplication. Patterns may include shapes or numbers. Creating of patterns is limited to CR items.</p>	
			3 – 4	

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Item Types	Cognitive Levels	Calculator	<b>Strand III – Patterns, Functions and Algebra</b>	
			<b>Sub-strand B. Algebra (Algebraic Thinking)</b>	
			Standard: Apply arithmetic operations in the correct order to compute with whole numbers in real-world and mathematical problems.	
			<b>Benchmarks</b>	
			Item Totals	
			By Strand	
			<i>continued</i>	
			By Sub-strand	
			3 - 4	
			By Benchmark	
MC	A B C	NC	<p><b>III.B.1</b> Students will identify a missing number or operation.</p> <p><i>Content Limit:</i> Operations are limited to addition, subtraction and multiplication. The total value of each side of an equation must be less than or equal to 100. Arithmetic expressions may be included on both sides of the equation. For example, <math>3 + \_ = 8</math> or <math>3 + 5 = \_ + 4</math>. Items may require identification of only 1 missing operation or number per item (<math>12 + 6 = 6 \_ 3</math>). Items may include context.</p>	2 – 3
MC	A B	NC	<p><b>III.B.2</b> Students will use the properties of arithmetic that involve order, grouping and the numbers 1 and 0, to do simple computations.</p> <p><i>Content Limit:</i> <i>Order</i> refers to commutative property. <i>Grouping</i> refers to associative property. Properties of the number 1 refer to the multiplicative identity. Properties of the number 0 refer to the additive identity or the multiplication property for 0. Operations are limited to addition and multiplication. Addends may contain at most two digits. Factors limited to 0 – 10. Items may have a maximum of three operations per item. Items may include context.</p>	1 – 2

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Item Types	Cognitive Levels	Calculator	<b>Strand IV – Data Analysis, Statistics and Probability</b>	
			<b>Item Totals</b>	
			<b>By Strand</b>	
			6 – 7	
		<b>By Sub-strand</b>		
		<b>By Benchmark</b>		
<b>MC or CR</b>	<b>A B C</b>	<b>CN</b>	<b>Sub-strand A. Data and Statistics</b>	
			Standard: Represent and interpret data in real-world and mathematical problems.	
			<b>Benchmarks</b>	
			<b>IV.A.1 and IV.A.2</b> Students will represent and describe data in tables and graphs using mathematical language. <i>Content Limit:</i> Data may be displayed using charts, tables, single bar graphs, circle graphs, pictographs, line graphs, line plots or Venn diagrams. Graphics may have at most five data categories. Scales are in increments of 1, 2, 5 or must be consistent with real-world applications. Bar graphs can be horizontal or vertical. Circle graphs may have at most four sectors. Students will not construct circle graphs. Pictograph keys must be less than or equal to five.	
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Item Types	Cognitive Levels	Calculator	<b>Strand IV – Data Analysis, Statistics and Probability</b>	<b>Item Totals</b>
			<b>Sub-strand B. Probability</b> Standard: Model simple probabilities by displaying the outcomes for real-world and mathematical problems.	<b>By Strand</b>
			<b>Benchmarks</b>	<i>continued</i>
			<b>Benchmarks</b>	<b>By Sub-strand</b>
				2 – 4
				<b>By Benchmark</b>
<b>MC or CR</b>	<b>A B C</b>	<b>CN</b>	<b>IV.B.1</b> Students will express outcomes of random experiments. <i>Content Limit:</i> Items may require students to express outcomes verbally or numerically. Answer options can be words or numbers. Answer outcomes in words do not have limits (e.g., 3 out of 12). Fraction denominators are limited to 2, 3, 4, 6 and 8.	1 – 2
			<b>IV.B.2</b> Students will represent possible arrangements of two or three objects. <i>Content Limit:</i> Items require physical models and/or pictures. Items with combinations may contain up to two sets and up to three objects in each set (e.g., how many combinations are possible with 3 crackers and 3 cheeses).	1 – 2

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Item Types	Cognitive Levels	Calculator	<b>Strand V – Spatial Sense, Geometry and Measurement</b>	
			<b>Item Totals</b>	
			<b>By Strand</b>	
			<b>Sub-strand A. Spatial Sense</b>	
			Standard: Understand spatial relationships and describe them using language such as congruent, similar, parallel and perpendicular.	
			<b>Benchmarks</b>	
			<b>By Sub-strand</b>	
			13 – 15	
			<b>By Benchmark</b>	
			2 – 4	
MC	A	CN	<b>V.A.1</b> Students will identify congruent and/or similar figures. <i>Content Limit:</i> Shapes are limited to circle, triangle, square, rectangle, rhombus, trapezoid, parallelogram, pentagon, hexagon or octagon. Right angle symbol (square in corner) may be included to indicate right angle. The concept of similarity will be assessed visually and not through vocabulary.	1 – 2
MC	A	CN	<b>V.A.2</b> Students will identify parallel and/or perpendicular lines. <i>Content Limit:</i> Right angle symbol may be included to indicate right angle. Items may include maps or other real-world context.	1 – 2

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Item Types	Cognitive Levels	Calculator	<b>Strand V – Spatial Sense, Geometry and Measurement</b>	<b>Item Totals</b>
			<b>Sub-strand B. Geometry</b> Standard: Use attributes of two- and three-dimensional shapes to identify them and distinguish between them.	<b>By Strand</b>
			<b>Benchmarks</b>	<i>continued</i>
				<b>By Sub-strand</b>
				3 – 5
				<b>By Benchmark</b>
<b>MC or CR</b>	<b>A B</b>	<b>CN</b>	<b>V.B.1</b> Students will identify and/or classify two- and three-dimensional shapes by their attributes. <i>Content Limit:</i> Shapes are limited to circle, triangle, square, rectangle, rhombus, trapezoid, parallelogram, other quadrilaterals, pentagon, hexagon, octagon, cube, cylinder, cone, sphere, rectangular prism, triangular prism or square pyramid. Items with three-dimensional shapes must include a diagram or picture. Items may require the identification of the difference between pyramid and prism. CR items may require a response that lists similarities and differences of two or more shapes.	1 – 3
			<b>V.B.2</b> Students will identify right angles in geometric figures or in appropriate objects. Students will determine whether angles in geometric figures are greater or less than a right angle. <i>Content Limit:</i> Items must include a diagram or picture. Angle measures are limited to increments of 30°. Items may include context.	1 – 3

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Item Types	Cognitive Levels	Calculator	<b>Strand V – Spatial Sense, Geometry and Measurement</b>	<b>Item Totals</b>
			<b>Sub-strand C. Measurement</b> Standard: Measure and calculate length and area using appropriate tools and units to solve real-world and mathematical problems. Make change with money.	<b>By Strand</b>
			<b>Benchmarks</b>	<i>continued</i>
			<b>Benchmarks</b>	<b>By Sub-strand</b>
				5 – 7
				<b>By Benchmark</b>
<b>MC or CR</b>	<b>A B C</b>	<b>CL</b>	<b>V.C.1</b> Students will find the area of a rectangle. Students will find the perimeter of a polygon. <i>Content Limit:</i> Items will involve using a grid when finding the area of a rectangle. Items may involve the use of a formula when finding perimeter. Polygons may be regular or irregular. Polygons may contain at most six sides. Lengths of sides of polygons must be whole numbers. When finding the perimeter of a polygon, conversion of units may be required, among inches and feet or feet and yards or centimeters and meters.	2 – 3
			<b>V.C.2</b> Students will demonstrate understanding that rectangles with the same area can have different perimeters. Students will demonstrate understanding that rectangles with the same perimeter can have different areas. <i>Content Limit:</i> Lengths of sides of rectangles must be whole numbers.	1 – 2
			<b>V.C.3</b> Students will make change in a variety of ways. <i>Content Limit:</i> Items may require students to make change using as few coins and bills as possible. Change will be made from an amount less than or equal to \$20. Items may require students only to make change given amount spent and amount given to clerk.	2 – 3