

Mathematics
Grade 5

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Item Types	Cognitive Levels	Calculator	Strand II – Number Sense	Item Totals
			Sub-strand A. Number Sense	By Strand
			Standard: Represent fractions, decimals and whole numbers in a variety of ways to quantify information and to solve real-world and mathematical problems. Understand the concept of negative numbers.	16 – 17
			Benchmarks	By Sub-strand
				5 – 7
				By Benchmark
MC or GR	A	CN	II.A.1 Students will read numbers in numerals and words. Students will write numbers in numerals and words. <i>Content Limit:</i> Numerals contain at most six digits. Items are limited to numbers with at most three decimal places.	1 – 2
MC or GR	A B	CN	II.A.2 Students will represent positive and negative integers on a number line and compare symbolically. Students will use positive and negative integers to solve real-world and mathematical problems. <i>Content Limit:</i> Items must be supported by context such as temperature, money or depth of ocean.	1 – 2
MC	A B	CN	II.A.3 Students will recognize equivalent common fractions, decimals and percentages. <i>Content Limit:</i> Fraction denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12. Decimals are limited to tenths, hundredths and thousandths. Fractions equivalent to repeating decimals will not be converted to equivalent decimals or percents (e.g., $\frac{1}{3}$ may be converted to $\frac{2}{6}$ but not $0.\bar{3}$)	1 – 2
MC	A B	NC	II.A.4 Students will use a variety of estimation strategies and decide when an estimated solution is appropriate. <i>Content Limit:</i> Strategies may include rounding, truncating (see glossary), overestimation and underestimation. Items may require choosing among various options to obtain an estimation, but not determining final estimation (e.g., $56 + 61$ rounded to $60 + 50$).	1 – 2

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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 fractions, decimals and 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
				9 – 11
				By Benchmark
MC or CR or GR	A B C	CL	II.B.1 Students will use addition, subtraction, multiplication and division to solve multi-step real-world and mathematical problems <i>Content Limit:</i> Multi-digit whole numbers are used.	2 – 3
MC or CR or GR	A B C	CN	II.B.2 Students will add and subtract in real-world and mathematical problems. <i>Content Limit:</i> Items may include at most two decimal places. Numbers have at most four digits. No fraction computation is required.	1 – 2
MC or GR	A	NC	II.B.3 Students will add and subtract. <i>Content Limit:</i> Items may include numbers with at most five digits, including decimal places. Sums are less than 10,000.	1 – 2
MC or GR	A	NC	II.B.4 Students will multiply. <i>Content Limit:</i> Factors may be whole numbers or decimals. Each factor may contain at most two digits.	1 – 2

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MC or GR	A	NC	<p>II.B.5 Students will divide. <i>Content Limit:</i> Items may involve only a one-digit divisor. Items may involve at most a three-digit dividend.</p>	1 – 2
MC or CR	A B	CN	<p>II.B.6 Students will model simple problems involving the addition and subtraction of common fractions and mixed numbers. <i>Content Limit:</i> MC items must provide a graphic. Fraction denominators given in items are limited to 2, 3, 4, 5, 6, 8, 10 and 12. Restrictions on denominators do not limit results. (e.g., $1/3 + 1/5$ is allowed; $1/15 - 1/3$ is not allowed). In a CR item requiring drawing or describing, fraction denominators are limited to 2, 3, 4, 6 and 8.</p>	1 – 2
MC or GR	A	CN	<p>II.B.7 Students will interpret percents as a part of a hundred. <i>Content Limit:</i> Whole number percents are between 0 and 100.</p>	1 – 2

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Item Types	Cognitive Levels	Calculator	Strand III – Patterns, Functions and Algebra	
			Item Totals	
			By Strand	
			6 – 7	
		Sub-strand A. Patterns and Functions		
		Standard: Understand and describe patterns in numbers, shapes, tables and graphs.		
		By Sub-strand		
		3 – 4		
		Benchmarks		
		By Benchmark		
MC or CR	A B C	CN	<p>III.A.1 Students will identify patterns in numbers, shapes, tables and graphs. Students will extend and explain how to extend those patterns.</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 eight terms beyond what is given. The largest value of any term provided or in an answer option is 1,000. The operations in growing or shrinking patterns are limited to addition, subtraction, multiplication and division The terms in a division pattern will be whole numbers. Divisors are less than 6. 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	Strand III – Patterns, Functions and Algebra	Item Totals
			Sub-strand B. Algebra (Algebraic Thinking) Standard: Represent mathematical relationships using equations.	By Strand
			Benchmarks	<i>continued</i>
				By Sub-strand
				3 – 4
				By Benchmark
MC	A B	CN	III.B.1 Students will represent and evaluate mathematical situations with simple number sentences. <i>Content Limit:</i> Whole numbers must be less than 1,000. When a variable is isolated, items may have a maximum of four operations per item. When a variable is not isolated, only one operation is allowed on each side of the equation (e.g., $5 + n = 17$). Items may include context.	3 – 4

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Item Types	Cognitive Levels	Calculator	Strand IV – Data Analysis, Statistics and Probability	
			Item Totals	
			By Strand	
			9 – 10	
			By Sub-strand	
Sub-strand A. Data and Statistics Standard: Represent data and use various measures associated with data to draw conclusions and identify trends.			6 – 8	
Benchmarks			By Benchmark	
MC	A B	CN	<p>IV.A.1 and IV.A.3 Students will determine which graph matches a given data set. Students will represent data with tables and graphs.</p> <p><i>Content Limit:</i> Data may be displayed in charts, tables, bar graphs, circle graphs, pictographs, line graphs, line plots, Venn Diagrams, maps and timelines. Graphics may have at most ten data categories. Scales are in increments of 1, 2, 5, 10 or must be consistent with real-world applications. Bar graphs may be vertical or horizontal. Circle graphs may have at most six sectors. Pictograph keys must be less than or equal to ten. Students will not be required to collect data on MCA-II.</p>	3 – 5
MC or CR	A B C	CN	<p>IV.A.2 Students will use fractions to compare data sets. Students will use percentages to compare data sets.</p> <p><i>Content Limit:</i> Fraction denominators are limited to 2, 3, 4, 5, 6, 8 and 10. When determining percents from a graphic, percents are limited to 0%, 10%, 25%, 33%, 50%, 67%, 75% and 100% Data may displayed in charts, tables, bar graphs, circle graphs, pictographs, line graphs, line plots, Venn Diagrams, maps and timelines. Data sets to be compared may be displayed using different representations (e.g., table and bar graph).</p>	1 – 2

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MC or CR or GR	A B C	CL	IV.A.4 Students will determine mean, mode, median and range of a data set. <i>Content Limit:</i> At most eight numbers are used to calculate mean. At most nine numbers are used to calculate median (must be an odd number of items in data set). Numbers used are less than 100. When determining the mode, the data set must contain a unique mode.	2 – 3
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Item Types	Cognitive Levels	Calculator	Strand IV – Data Analysis, Statistics and Probability	Item Totals
			Sub-strand B. Probability Standard: Calculate and express probabilities numerically and apply probability concepts to solve real-world and mathematical problems.	By Strand
			Benchmarks	<i>continued</i>
				By Sub-strand
MC or CR	A B C	CN	<p>IV.B.1 Students will represent all possible outcomes for a simple probability problem with tables and grids and draw conclusions from the results.</p> <p><i>Content Limit:</i> Experiments may include number cubes, cards, spinners, coins or marbles. Items have a limit of 100 objects. Given a set of circumstances, responses may include probabilities that range from impossible to certain. Items may require determining probability given all possible outcomes. Probabilities may be expressed as a fraction, decimal or percent.</p>	2 – 4

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Item Types	Cognitive Levels	Calculator	Strand V – Spatial Sense, Geometry and Measurement	Item Totals
			Sub-strand A. Spatial Sense Standard: Understand the concept of reflection and rotation symmetry as applied to two-dimensional shapes.	By Strand 12 – 13
			Benchmarks	By Sub-strand 1 – 2
				By Benchmark
MC	A	CN	V.A.1 Students will identify or describe reflection symmetry in two-dimensional shapes and designs. <i>Content Limit:</i> In reflection symmetry items, items may require the identification of lines of reflection symmetry in a triangle, quadrilateral, pentagon, hexagon and octagon. Figures showing reflection symmetry will not have any more than two lines of symmetry drawn.	1 – 2

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Item Types	Cognitive Levels	Calculator	Strand V – Spatial Sense, Geometry and Measurement	Item Totals
			Sub-strand B. Geometry Standard: Sort, classify, compare and describe two- and three-dimensional objects.	By Strand
			Benchmarks	<i>continued</i>
			Benchmarks	By Sub-strand
				5 – 6
				By Benchmark
MC or CR	A B	CN	V.B.1 Students will sort three-dimensional objects according to number and shape of faces, number of edges and vertices. <i>Content Limit:</i> Objects are limited to cube, triangular prism, rectangular prism and pyramids. Pictures or diagrams must be included. Items may include context. CR items may include concepts from other V.B benchmarks.	1 – 2
MC	A B	CN	V.B.2 Students will classify, compare and identify acute, right and obtuse angles. <i>Content Limit:</i> Pictures or diagrams must be included. Angle measures are limited to increments of 15°.	1 – 2
MC or CR	A B	CN	V.B.3 Students will classify polygons as regular or irregular. <i>Content Limit:</i> Polygons may have at most eight sides. CR items may include concepts from other V.B benchmarks	1 – 2
MC or GR	A B	CN	V.B.4 Students will know the sum of the angles in triangles and quadrilaterals. <i>Content Limit:</i> The right angle symbol or 90° must designate right angles.	1 – 2

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Item Types	Cognitive Levels	Calculator	Strand V – Spatial Sense, Geometry and Measurement	Item Totals
			Sub-strand C. Measurement Standard: Measure and calculate length, area and capacity using appropriate tools and units to solve real-world and mathematical problems.	By Strand
			Benchmarks	<i>continued</i>
			Benchmarks	By Sub-strand
				5 – 6
				By Benchmark
MC or CR or GR	A B C	CN	V.C.1 Students will find the area of a polygon and label the answer with appropriate units. Students will find the perimeter of a polygon and label the answer with appropriate units. <i>Content Limit:</i> For perimeter items, shapes are limited to triangle, quadrilateral, pentagon and hexagon. For area items, shapes are limited to triangle and rectangles placed on a grid. Grid units must be whole numbers.	1 – 2
			V.C.2 Students will use a net of a cube or rectangular box to compute the surface area. <i>Content Limit:</i> Nets will be placed on a grid. Grid units must be whole numbers.	1 – 2
			V.C.3 Students will select and apply appropriate units and tools to measure perimeter, area and capacity. <i>Content Limit:</i> Items may address metric or customary measurements but not both within same item. Units within an item will be consistent. Lengths of sides are measured in inches, feet, centimeters or meters. Capacity is measured in cup, quart, gallon or liter.	1 – 2