

## BENCHMARKS ASSESSED AT GRADES 3–5

Grade 3	Grade 4	Grade 5
<b>Big Idea 1:</b> Develop understandings of multiplication and division and strategies for basic multiplication facts and related division facts.	<b>Big Idea 1:</b> Develop quick recall of multiplication facts and related division facts and fluency with whole number multiplication.	<b>Big Idea 1:</b> Develop an understanding of and fluency with division of whole numbers.
<b>MA.3.A.1.1</b> Model multiplication and division including problems presented in context: repeated addition, multiplicative comparison, array, how many combinations, measurement, and partitioning.	<b>MA.4.A.1.1</b> Use and describe various models for multiplication in problem-solving situations, and demonstrate recall of basic multiplication and related division facts with ease. (Assessed with MA.4.A.1.2.)	<b>MA.5.A.1.1</b> Describe the process of finding quotients involving multi-digit dividends using models, place value, properties and the relationship of division to multiplication.
<b>MA.3.A.1.2</b> Solve multiplication and division fact problems by using strategies that result from applying number properties.	<b>MA.4.A.1.2</b> Multiply multi-digit whole numbers through four digits fluently, demonstrating understanding of the standard algorithm, and checking for reasonableness of results, including solving real-world problems. (Also assesses MA.4.A.1.1.)	<b>MA.5.A.1.2</b> Estimate quotients or calculate them mentally depending on the context and numbers involved. (Assessed with MA.5.A.1.4.)
<b>MA.3.A.1.3</b> Identify, describe, and apply division and multiplication as inverse operations.		<b>MA.5.A.1.3</b> Interpret solutions to division situations including those with remainders depending on the context of the problem. (Assessed with MA.5.A.1.4.)
		<b>MA.5.A.1.4</b> Divide multi-digit whole numbers fluently, including solving real-world problems, demonstrating understanding of the standard algorithm and checking the reasonableness of results. (Also assesses MA.5.A.1.2 and MA.5.A.1.3.)

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<b>Big Idea 2:</b> Develop an understanding of fractions and fraction equivalence.	<b>Big Idea 2:</b> Develop an understanding of decimals, including the connection between fractions and decimals.	<b>Big Idea 2:</b> Develop an understanding of and fluency with addition and subtraction of fractions and decimals.
<b>MA.3.A.2.1</b> Represent fractions, including fractions greater than one, using area, set and linear models.	<b>MA.4.A.2.1</b> Use decimals through the thousandths place to name numbers between whole numbers. (Assessed with MA.4.A.2.3 and MA.4.A.2.4.)	<b>MA.5.A.2.1</b> Represent addition and subtraction of decimals and fractions with like and unlike denominators using models, place value or properties. (Also assesses MA.5.A.6.1.)
<b>MA.3.A.2.2</b> Describe how the size of the fractional part is related to the number of equal sized pieces in the whole. (Assessed with MA.3.A.2.3.)	<b>MA.4.A.2.2</b> Describe decimals as an extension of the base-ten number system. (Assessed with MA.4.A.2.3 and MA.4.A.2.4.)	<b>MA.5.A.2.2</b> Add and subtract fractions and decimals fluently and verify the reasonableness of results, including in problem situations. (Also assesses MA.5.A.2.3 and MA.5.A.6.1.)
<b>MA.3.A.2.3</b> Compare and order fractions, including fractions greater than one, using models and strategies. (Also assesses MA.3.A.2.2.)	<b>MA.4.A.2.3</b> Relate equivalent fractions and decimals with and without models, including locations on a number line. (Also assesses MA.4.A.2.1 and MA.4.A.2.2.)	<b>MA.5.A.2.3</b> Make reasonable estimates of fraction and decimal sums and differences, and use techniques for rounding. (Assessed with MA.5.A.2.2.)
<b>MA.3.A.2.4</b> Use models to represent equivalent fractions, including fractions greater than one, and identify representations of equivalence.	<b>MA.4.A.2.4</b> Compare and order decimals, and estimate fraction and decimal amounts in real-world problems. (Also assesses MA.4.A.2.1 and MA.4.A.2.2.)	<b>MA.5.A.2.4</b> Determine the prime factorization of numbers. (Also assesses MA.5.A.6.1.)

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<b>Big Idea 3:</b> Describe and analyze properties of two-dimensional shapes.	<b>Big Idea 3:</b> Develop an understanding of area and determine the area of two-dimensional shapes.	<b>Big Idea 3:</b> Describe three-dimensional shapes and analyze their properties, including volume and surface area.
<b>MA.3.G.3.1</b> Describe, analyze, compare and classify two-dimensional shapes using sides and angles—including acute, obtuse, and right angles—and connect these ideas to the definition of shapes.	<b>MA.4.G.3.1</b> Describe and determine area as the number of same-sized units that cover a region in the plane, recognizing that a unit square is the standard unit for measuring area.	<b>MA.5.G.3.1</b> Analyze and compare the properties of two-dimensional figures and three-dimensional solids (polyhedra), including the number of edges, faces, vertices, and types of faces.
<b>MA.3.G.3.2</b> Compose, decompose, and transform polygons to make other polygons, including concave and convex polygons with three, four, five, six, eight, or ten sides.	<b>MA.4.G.3.2</b> Justify the formula for the area of the rectangle “area = base × height.”	<b>MA.5.G.3.2</b> Describe, define and determine surface area and volume of prisms by using appropriate units and selecting strategies and tools.
<b>MA.3.G.3.3</b> Build, draw and analyze two-dimensional shapes from several orientations in order to examine and apply congruence and symmetry.	<b>MA.4.G.3.3</b> Select and use appropriate units, both customary and metric, strategies, and measuring tools to estimate and solve real-world area problems.	
<b>Supporting Idea: Algebra</b>		
<b>MA.3.A.4.1</b> Create, analyze, and represent patterns and relationships using words, variables, tables and graphs.	<b>MA.4.A.4.1</b> Generate algebraic rules and use all four operations to describe patterns, including nonnumeric growing or repeating patterns.	<b>MA.5.A.4.1</b> Use the properties of equality to solve numerical and real world situations.
	<b>MA.4.A.4.2</b> Describe mathematics relationships using expressions, equations, and visual representations.	<b>MA.5.A.4.2</b> Construct and describe a graph showing continuous data, such as a graph of a quantity that changes over time. (Assessed with MA.5.S.7.1 and MA.5.S.7.2.)
	<b>MA.4.A.4.3</b> Recognize and write algebraic expressions for functions with two operations.	

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<b>Supporting Idea: Geometry and Measurement</b>		
<b>MA.3.G.5.1</b> Select appropriate units, strategies and tools to solve problems involving perimeter.	<b>MA.4.G.5.1</b> Classify angles of two-dimensional shapes using benchmark angles (i.e. 45°, 90°, 180°, and 360°).	<b>MA.5.G.5.1</b> Identify and plot ordered pairs on the first quadrant of the coordinate plane.
<b>MA.3.G.5.2</b> Measure objects using fractional parts of linear units such as $\frac{1}{2}$ , $\frac{1}{4}$ , and $\frac{1}{10}$ .	<b>MA.4.G.5.2</b> Identify and describe the results of translations, reflections, and rotations of 45, 90, 180, 270, and 360 degrees, including figures with line and rotational symmetry.	<b>MA.5.G.5.2</b> Compare, contrast, and convert units of measure within the same dimension (length, mass, or time) to solve problems.
<b>MA.3.G.5.3</b> Tell time to the nearest minute and to the nearest quarter hour, and determine the amount of time elapsed.		<b>MA.4.G.5.3</b> Identify and build a three-dimensional object from a two-dimensional representation of that object and vice versa.
		<b>MA.5.G.5.4</b> Derive and apply formulas for areas of parallelograms, triangles, and trapezoids from the area of a rectangle.
<b>Supporting Idea: Number and Operations</b>		
<b>MA.3.A.6.1</b> Represent, compute, estimate and solve problems using numbers through hundred thousands.	<b>MA.4.A.6.1</b> Use and represent numbers through millions in various contexts, including estimation of relative sizes of amounts or distances.	<b>MA.5.A.6.1</b> Identify and relate prime and composite numbers, factors and multiples within the context of fractions. (Assessed with MA.5.A.2.1, MA.5.A.2.2 and MA.5.A.2.4.)
<b>MA.3.A.6.2</b> Solve non-routine problems by making a table, chart, or list and searching for patterns.	<b>MA.4.A.6.2</b> Use models to represent division as: <ul style="list-style-type: none"> <li>• the inverse of multiplication</li> <li>• as partitioning</li> <li>• as successive subtraction</li> </ul>	
	<b>MA.4.A.6.3</b> Generate equivalent fractions and simplify fractions.	<b>MA.5.A.6.3</b> Describe real-world situations using positive and negative numbers.
	<b>MA.4.A.6.4</b> Determine factors and multiples for specified whole numbers.	<b>MA.5.A.6.4</b> Compare, order, and graph integers, including integers shown on a number line.

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<b>Supporting Idea: Number and Operations (Continued)</b>		
	<b>MA.4.A.6.5</b> Relate halves, fourths, tenths, and hundredths to decimals and percents.	<b>MA.5.A.6.5</b> Solve non-routine problems using various strategies including “solving a simpler problem” and “guess, check, and revise.”
	<b>MA.4.A.6.6</b> Estimate and describe reasonableness of estimates; determine the appropriateness of an estimate versus an exact answer.	
<b>Supporting Idea: Data Analysis</b>		
<b>MA.3.S.7.1</b> Construct and analyze frequency tables, bar graphs, pictographs, and line plots from data, including data collected through observations, surveys, and experiments.		<b>MA.5.S.7.1</b> Construct and analyze line graphs and double bar graphs. (Also assesses MA.5.A.4.2.)
		<b>MA.5.S.7.2</b> Differentiate between continuous and discrete data and determine ways to represent those using graphs and diagrams. (Also assesses MA.5.A.4.2.)