

BENCHMARKS ASSESSED AT GRADES 6–8

Grade 6	Grade 7	Grade 8
Big Idea 1: Develop an understanding of and fluency with multiplication and division of fractions and decimals.	Big Idea 1: Develop an understanding of and apply proportionality, including similarity.	Big Idea 1: Analyze and represent linear functions and solve linear equations and systems of linear equations.
MA.6.A.1.1 Explain and justify procedures for multiplying and dividing fractions and decimals.	MA.7.A.1.1 Distinguish between situations that are proportional or not proportional and use proportions to solve problems.	MA.8.A.1.1 Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range and the difference between discrete and continuous data.
MA.6.A.1.2 Multiply and divide fractions and decimals efficiently. (Assessed with MA.6.A.1.3.)	MA.7.A.1.2 Solve percent problems, including problems involving discounts, simple interest, taxes, tips and percents of increase or decrease.	MA.8.A.1.2 Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem.
MA.6.A.1.3 Solve real-world problems involving multiplication and division of fractions and decimals. (Also assesses MA.6.A.1.2.)	MA.7.A.1.3 Solve problems involving similar figures.	MA.8.A.1.3 Use tables, graphs, and models to represent, analyze, and solve real-world problems related to systems of linear equations. (Also assesses MA.8.A.1.4.)
	MA.7.A.1.4 Graph proportional relationships and identify the unit rate as the slope of the related linear function.	MA.8.A.1.4 Identify the solution to a system of linear equations using graphs. (Assessed with MA.8.A.1.3.)
	MA.7.A.1.5 Distinguish direct variation from other relationships, including inverse variation.	MA.8.A.1.5 Translate among verbal, tabular, graphical and algebraic representations of linear functions.
	MA.7.A.1.6 Apply proportionality to measurement in multiple contexts, including scale drawings and constant speed.	MA.8.A.1.6 Compare the graphs of linear and non-linear functions for real-world situations.

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Big Idea 2: Connect ratio and rates to multiplication and division.	Big Idea 2: Develop an understanding of and use formulas to determine surface areas and volumes of three-dimensional shapes.	Big Idea 2: Analyze two- and three-dimensional figures by using distance and angle.
MA.6.A.2.1 Use reasoning about multiplication and division to solve ratio and rate problems.	MA.7.G.2.1 Justify and apply formulas for surface area and volume of pyramids, prisms, cylinders, and cones.	MA.8.G.2.1 Use similar triangles to solve problems that include height and distances.
MA.6.A.2.2 Interpret and compare ratios and rates.	MA.7.G.2.2 Use formulas to find surface areas and volume of three-dimensional composite shapes.	MA.8.G.2.2 Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals.
		MA.8.G.2.3 Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles, and the sum of angles in polygons.
		MA.8.G.2.4 Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane.
Big Idea 3: Write, interpret, and use mathematical expressions and equations.	Big Idea 3: Develop an understanding of operations on all rational numbers and solving linear equations.	Big Idea 3: Analyze and summarize data sets.
MA.6.A.3.1 Write and evaluate mathematical expressions that correspond to given situations. (Also assesses MA.6.A.3.3.)	MA.7.A.3.1 Use and justify the rules for adding, subtracting, multiplying, dividing, and finding the absolute value of integers.	MA.8.S.3.1 Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships.

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MA.6.A.3.2 Write, solve, and graph one- and two- step linear equations and inequalities. (Also assesses MA.6.A.3.4.)	MA.7.A.3.2 Add, subtract, multiply, and divide integers, fractions, and terminating decimals, and perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts. MA.7.A.3.3 Formulate and use different strategies to solve one-step and two-step linear equations, including equations with rational coefficients. (Also assesses MA.7.A.5.2.) MA.7.A.3.4 Use the properties of equality to represent an equation in a different way and to show that two equations are equivalent in a given context.	MA.8.S.3.2 Determine and describe how changes in data values impact measures of central tendency.
MA.6.A.3.3 Works backward with two-step function rules to undo expressions. (Assessed with MA.6.A.3.1.)		
MA.6.A.3.4 Solve problems given a formula. (Assessed with MA.6.A.3.2, MA.6.G.4.1, MA.6.G.4.2, and MA.6.G.4.3.)		
MA.6.A.3.5 Apply the Commutative, Associative, and Distributive Properties to show that two expressions are equivalent.		
MA.6.A.3.6 Construct and analyze tables, graphs and equations to describe linear functions and other simple relations using both common language and algebraic notation.		
Supporting Idea: Algebra		
		MA.8.A.4.1 Solve literal equations for a specified variable.
		MA.8.A.4.2 Solve and graph one- and two-step inequalities in one variable.
Supporting Idea: Geometry and Measurement		
MA.6.G.4.1 Understand the concept of π , know common estimates of π (3.14; $\frac{22}{7}$ and use these values to estimate and calculate the circumference and the area of circles. (Also assesses MA.6.A.3.4.)	MA.7.G.4.1 Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and apply these relationships to solve problems.	MA.8.G.5.1 Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems.

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Supporting Idea: Geometry and Measurement (Continued)		
<p>MA.6.G.4.2 Find the perimeters and areas of composite two-dimensional figures, including non-rectangular figures (such as semicircles) using various strategies. (Also assesses MA.6.A.3.4.)</p>	<p>MA.7.G.4.2 Predict the results of transformations and draw transformed figures, with and without the coordinate plane.</p>	
	<p>MA.7.G.4.3 Identify and plot ordered pairs in all four quadrants of the coordinate plane.</p>	
<p>MA.6.G.4.3 Determine a missing dimension of a plane figure or prism, given its area or volume and some of the dimensions, or determine the area or volume given the dimensions. (Also assesses MA.6.A.3.4.)</p>	<p>MA.7.G.4.4 Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems.</p>	
Supporting Idea: Number and Operations		
<p>MA.6.A.5.1 Use equivalent forms of fractions, decimals, and percents to solve problems.</p>	<p>MA.7.A.5.1 Express rational numbers as terminating or repeating decimals.</p>	<p>MA.8.A.6.1 Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems.</p>
<p>MA.6.A.5.2 Compare and order fractions, decimals, and percents, including finding their approximate location on a number line.</p>	<p>MA.7.A.5.2 Solve non-routine problems by working backwards. (Assessed with MA.7.A.3.3.)</p>	<p>MA.8.A.6.2 Make reasonable approximations of square roots and mathematical expressions that include square roots, and use them to estimate solutions to problems and to compare mathematical expressions involving real numbers and radical expressions.</p>
<p>MA.6.A.5.3 Estimate the results of computations with fractions, decimals, and percents and judge the reasonableness of the results.</p>		<p>MA.8.A.6.3 Simplify real number expressions using the laws of exponents. (Assessed with MA.8.A.6.4.)</p>

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Supporting Idea: Number and Operations (Continued)		
		MA.8.A.6.4 Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems. (Also assesses MA.8.A.6.3.)
Supporting Idea: Data Analysis		
MA.6.S.6.1 Determine the measures of central tendency (mean, median, and mode) and variability (range) for a given set of data.	MA.7.S.6.1 Evaluate the reasonableness of a sample to determine the appropriateness of generalizations made about the population.	
MA.6.S.6.2 Select and analyze the measures of central tendency or variability to represent, describe, analyze and/or summarize a data set for the purpose of answering questions appropriately.	MA.7.S.6.2 Construct and analyze histograms, stem-and-leaf plots, and circle graphs.	
Supporting Idea: Probability		
	MA.7.P.7.1 Determine the outcome of an experiment and predict which events are likely or unlikely, and if the experiment is fair or unfair.	
	MA.7.P.7.2 Determine, compare, and make predictions based on experimental or theoretical probability of independent or dependent events.	