

# Mathematics 6 At-a-Glance

## Marking Period 1

Ratios, Fractions, and Decimals	
Sept	<ul style="list-style-type: none"> <li>• <b>Topic 1: Understanding Ratios and Rates</b> Students investigate the concepts of ratio and rate. They use multiple forms of ratio language and ratio notation and make connections between ratios and fractions. Students relate their understanding of ratios to explain and classify different types of ratios; including rate and unit rate. They use reasoning about multiplication and division to solve ratio and rate problems about quantities.</li> </ul>
Sept/ Oct	<ul style="list-style-type: none"> <li>• <b>Topic 2: Application of Ratios and Rates</b> Students apply reasoning when solving collections of ratio problems in real world contexts using various tools. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in a table, students connect their understanding of multiplication and division with ratios and rates. Students solve a wide variety of problems involving ratios and rates, discovering that a percent of a quantity is a rate per 100. Although it is traditional to move students quickly to solving proportions by cross multiplying, it is imperative for students to reason multiplicatively with ratios to aid their understanding of future mathematics.</li> </ul>
Oct	<ul style="list-style-type: none"> <li>• <b>Topic 3: Division of Fractions</b> Students conclude the work with fraction operations from previous grade levels by computing quotients of fractions. Students investigate two interpretations of division: measurement and sharing. They can use story contexts and visual models to develop an understanding of computing quotients of fractions, and begin to move to using the relationship between division and multiplication to determine the standard algorithm of dividing fractions.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Topic 4: Multi-Digit Computation (dividing whole numbers and adding/subtracting decimals)</b> Students are expected to demonstrate fluency in two computation standards by the end of Grade 6. During the first marking period, students divide multi-digit numbers using the standard algorithm. They also add and subtract multi-digit decimals using the standard algorithm. Students use estimation and place-value understandings to explain computation with the standard algorithms. The standard algorithms become parts of a repertoire of strategies used throughout the year. A spectrum of multi-step word problems of varying complexity levels are purposefully incorporated throughout the year as new learning is developed and applied.</li> </ul>

## Marking Period 2

Number Relationships	
Nov	<ul style="list-style-type: none"> <li>• <b>Topic 1: Multi-Digit Computation (multiplying and dividing decimals)</b> Students use their knowledge of equivalent fractions to fluently multiply and divide multi-digit decimals using the standard algorithm. A spectrum of multi-step word problems of varying complexity levels are purposefully incorporated throughout the year as new learning is developed and applied.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Topic 2: Extending the Number Line</b> Students are focused on developing an understanding of the meaning of negative numbers in real-world contexts. Students extend their previous understandings of number and ordering of numbers to the rational number system, which includes negative rational numbers.</li> </ul>
Dec/ Jan	<ul style="list-style-type: none"> <li>• <b>Topic 3: Order and Absolute Value</b> The number line serves as a model for students to relate integers and other rational numbers to statements of order in real-world contexts. Students describe the relationship between rational numbers in real-world scenarios with respect to numbers' positions on the number line. Students use the concept of absolute value and its notation to show a number's distance from zero on the number line and recognize that opposite numbers have the same absolute value. Using real-world scenarios, students interpret absolute value. They apply their understanding to distinguish comparisons of absolute value from statements about order.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Topic 4: Coordinate Relationships</b> Students extend their understanding of the ordering of rational numbers on a number line to the coordinate plane. Students determine the relationship between the signs of numbers in an ordered pair in relation to the location of the point. They build upon their foundational understanding of plotting points in the first quadrant and transition to locating points in all four quadrants.</li> </ul>
Jan	<ul style="list-style-type: none"> <li>• <b>Topic 5: Multi-Digit Computation (divide whole numbers and decimal operations)</b> Students use their knowledge of equivalent fractions to fluently multiply and divide multi-digit decimals using the standard algorithm, including multi-step word problems of varying complexity levels.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Topic 6: Exponents</b> Students apply prior knowledge of place value and powers of ten and extend this knowledge to any positive rational number using repeated multiplication. Students develop the conceptual understanding that a whole number exponent is equivalent to repeated multiplication. In order to develop this conceptual understanding, students write and evaluate numerical expressions that are limited to whole number exponents.</li> </ul>

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### Marking Period 3

Expressions and Equations	
Jan/ Feb	<ul style="list-style-type: none"> <li>• <b>Topic 1: Introducing Algebraic Expressions</b> Students begin working systematically with algebraic expressions and use mathematical terms to clarify parts of an expression. They write, evaluate, and interpret expressions that correspond to given situations. Students use variables or letters to stand for unknowns to write expressions. When given the value of the variable, students use the Order of Operations to evaluate expressions. Students write expressions by abstracting patterns thus summarizing a calculation that can be carried out repeatedly with different numbers. They recognize how one part of the expression can impact the other parts and they view those parts as a single entity.</li> </ul>
Feb	<ul style="list-style-type: none"> <li>• <b>Topic 2: Properties and Equivalency</b> Students now consider common factors and multiples and find greatest common factors and least common multiples. Students apply their knowledge of common factors and multiples by using the distributive property. Students use previous understandings of equivalent numerical expressions to algebraic expressions. Students extend their work with properties of operations from arithmetic to algebra.</li> </ul>
Feb/ Mar	<ul style="list-style-type: none"> <li>• <b>Topic 3: Equations and Inequalities</b> Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations and inequalities. Students understand the solution of an equation is the value of the variable that makes the equation true. It is important for students to state precisely the meaning of variables they use when setting up equations. Students solve real-world problems and represent inequalities on number line diagrams.</li> </ul>
Mar	<ul style="list-style-type: none"> <li>• <b>Topic 4: Relationships Between Variables</b> In addition to constructing and solving equations in one variable, students will use equations in two variables to express relationships between two quantities that vary together. As they work with two-variable equations, students begin to develop a dynamic understanding of variables and an appreciation that they can stand for any number from some domain. Students solve equations in real-world, contextual problems. Students will construct tables of independent and dependent values in order to analyze equations with two variables from real-life contexts. They will represent equations by plotting values from the tables on a coordinate grid.</li> </ul>

### Marking Period 4

Geometric and Statistical Relationships	
Apr	<ul style="list-style-type: none"> <li>• <b>Topic 1: Relating Area and Volume</b> Students develop the formula for the area of triangles. They apply their knowledge of the area of triangular and/or rectangular regions to determine the area of quadrilaterals, polygons, and composite figures in real-life contexts. Students build on their understanding of how to find the volume of a right rectangular prism to include those with fractional edge lengths. They explore how the volume of a shape can be found by composing or decomposing shapes including when the edge lengths are fractional. Students apply formulas and use their previous experience with solving equations to find the values of missing volumes or missing dimensions.</li> </ul>
Apr/ May	<ul style="list-style-type: none"> <li>• <b>Topic 2: Surface Area</b> Students deconstruct solid figures into nets to identify the measurement of the solids' face edges and area. They use nets to develop, then apply the formula for surface area of prisms.</li> </ul>
May	<ul style="list-style-type: none"> <li>• <b>Topic 3: Multi-Digit Computation (dividing whole numbers &amp; decimals operations)</b> During the fourth marking period, students use the standard algorithm to fluently operate with multi-digit numbers and decimals. A spectrum of multi-step word problems of varying complexity levels are purposefully incorporated in this topic as new learning is developed and applied.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Topic 4: Statistical Questions</b> Students differentiate between statistical and non-statistical types of questions. Statistical questions anticipate variability in the question which needs to be accounted for in the answer. Variability is explored in terms of the context, the statistical question being asked, measures of center and spread, and the display of the data.</li> </ul>
Jun	<ul style="list-style-type: none"> <li>• <b>Topic 5: Analyzing Data Distributions</b> Students recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. Students display numerical data in plots on a number line, including dot plots, histograms, and box plots. They learn to describe and summarize numerical data sets by identifying clusters, peaks, gaps, symmetry, skew, and outliers considering the context in which the data were collected. Exploring variation with the mean absolute deviation (MAD) sets the stage for introducing the standard deviation in later grades.</li> </ul>