# Grade 6

In Grade 6, instruction should focus on four critical areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negati

## Grade 6 (continued)

summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability. Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.

Students in Grade 6 also build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them int

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| Ratios and Proportional Relationships (RP) | |
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| **Understand ratio concepts and use ratio reasoning to solve problems** | |
| 6.RP.1 | Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."* |

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| 6.NS.4 | Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1ï100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2).* |
| **Apply and extend previous understandings of numbers to the system of rational numbers** | |
| 6.NS.5 | Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea |

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| 6.NS.9 | Apply and extend previous understandings of addition and subtraction to add and subtract integers; represent addition and subtraction on a horizontal or vertical number line diagram.<br>a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged*.<br>b. Understand $p + q$ as the number located a distance $\|q\|$ from $p$, in the positive or negative direction depending on whether $q$ is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of integers by describing real-world contexts.<br>c. Understand subtraction of integers as adding the additive inverse, $p – q = p + (–q)$. Show that the distance between two integers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.<br>d. Apply properties of operations as strategies to add and subtract integers. |

## Expressions and Equations (EE)

**Apply and extend previous understandings of arithmetic to algebraic expressions**

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| 6.EE.1 | Write and evaluate numerical expressions involving whole-number exponents. |
| 6.EE.2 | Write, read, and evaluate expressions in which letters stand for numbers.<br>a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.*<br>b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.*<br>c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *rPVpöÉ* |

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| 6.EE.7 | Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which $p$, $q$ and $x$ are all nonnegative rational numbers. |
| 6.EE.8 | Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams. |

| **Represent and analyze quantitative relationships between dependent and independent variables** | |
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| 6.EE.9 | Use variables to represent two quantities in a real-world problem that change in relationship to one another.<br>• Write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.<br>• Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.<br>*For example, in a problem involving motion at constant speed, list and graph ordered pairs of* |

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| Summarize and describe distributions | |
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| 6.SP.4 | Display numerical data in plots on a number line, including dot plots, histograms, and box plots. |
| 6.SP.5 | Summarize numerical data sets in relation to their context, such as by:<br>a. Reporting the number of observations.<br>b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.<br>c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.<br>d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. |

[1] Expectations for unit rates in this grade are limited to non-complex fractions.

# Additional Resource

## 2016 Mississippi College- and Career-Standards Scaffolding Document

The primary purpose of the *2016 Mississippi College- and Career-Readiness Standards Scaffolding Document* is to provide teachers with a deeper understanding of the Standards as they plan for classroom instruction. Based on the 2016 Mississippi College- and Career-Readiness Standards for Mathematics, this document provides a close analysis of the requirements for student mastery. Because of the rigor and depth of the Standards, scaffolding instruction to meet the needs of all learners is essential to individual success. The Scaffolding Document will aid teachers' understanding of how to teach the Standards through a natural progression of student mastery. The Scaffolding Document can be found at **http://www.mde.k12.ms.us/ESE/ccr**.

**Standards for Mathematical Practice**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.