6th grade Mathematics Considerations from Achieve the Core/CCSSO

2020–21 Priority Instructional Content in English Language Arts/Literacy and Mathematics

Grade 6 Mathematics Priority Instructional Content for the 2020–21 School Year

The Mathematics Priority Instructional Content for the 2020–21 School Year (Mathematics Instructional Priorities) is designed to support decisions about how to elevate some of the most important mathematics at each grade level in the coming school year while reducing time and intensity for topics that are less integral to the overall coherence of college- and career-ready standards.

At each grade level from kindergarten through grade 8, the Mathematics Instructional Priorities name the grade-level mathematics that is of highest priority at each grade; provide a framework for strategically drawing in prior grade-level content that has been identified as essential for supporting students' engagement with the most important grade-level work; and suggest ways to reduce or sometimes eliminate topics in a way that minimizes the impact to overall coherence. In using this guidance, decision makers should thoughtfully consider in their unique context the likely implications of the spring 2020 disruption as decisions are made to select supports to ensure that students are able to successfully engage with the grade-level content. Decision makers should also bear in mind that while this document articulates content priorities, elevating the Standards for Mathematical Practice in connection with grade-level content is always a priority.

At each grade level, recommendations are provided for facilitating social, emotional, and academic development (SEAD) in mathematics. These recommendations stress themes of discourse, belonging, agency and identity and can either be applied across grades (even if only listed in one) or they can be modified to fit different grades. These themes of discourse, belonging, agency, and identity are integral to the Standards of Mathematical Practice and the language in the recommendations reflects this connection.

The 2020–21 school year presents a unique set of opportunities and challenges due to the disruption to instruction in spring 2020 as well as the uncertainty associated with the 2020–2021 school year. The Mathematics Instructional Priorities are provided in response to these conditions. They are not criteria, and they do not revise the standards. Rather, they are potential ways, and not the only ways possible, to help students engage deeply with grade-level mathematics in the 2020–21 school year.

The Mathematics Instructional Priorities do not stand alone but are to be used in conjunction with college- and career-ready standards. One reason for this is that codes such as 6.RP.A must be traced back to the standards in order to see the language to which they refer. The Mathematics Instructional Priorities do not reiterate what the standards already say—even in cases where the specific language of a standard is fundamentally important to a high-quality aligned curriculum. Nor do the Mathematics Instructional Priorities mention every opportunity the standards afford to make coherent connections within a grade or between one grade and another—again, even when those connections are fundamentally important and are the basis for the guidance given. Therefore the Mathematics Instructional Priorities will be used most powerfully in cross-grade collaboration among educators who know the standards well and can use existing resources such as the *Progressions* documents and other resources listed in the Appendix.

While the grade-level guidance isn't specific to any math program or set of programs, an examination of a selection of curriculum scope and sequence documents informed the recommendations, especially recommendations about when and how to integrate prior-grade concepts into the current grade. The guidance does not list all possible prior-grade content relevant to the current grade, but instead concentrates the recommendations on the most critical prior-grade connections, with greater emphasis on that content which was likely taught during the last third of the 2019–20 school year based on the scope and sequence analysis.

Where to focus Grade 6 Mathematics?

College- and career-ready mathematics standards have important emphases at each grade level, which for grade 6 are highlighted in this Focus Document. The considerations for the 2020–21 school year that follow are intended to be a companion to the Focus Document. Users should have both documents in hand, as well as a copy of grade-level standards, when considering these recommendations.

For the 2020–21 school year, prioritization of grade-level mathematical concepts combined with some incorporation of prior-grade knowledge and skills will be essential to support all students in meeting grade-level expectations. For these unique times, Student Achievement Partners has developed additional guidance above and beyond what is communicated through the major work designations. As described at greater length on the previous page, the following tables:

- Name priority instructional content at each grade;
- Provide considerations for addressing grade-level content in a coherent way;
- Articulate selected content from the prior grade that may be needed to support students in fully engaging with grade-level mathematics;
- Suggest where adaptations can be made to allow for additional time on the most important topics; and
- Provide suggestions for ways to promote social, emotional, and academic development (SEAD) in grade-level mathematics learning, often through the Standards for Mathematical Practice.

The considerations repeatedly use several verbs, such as *combine*, *integrate*, etc. The verbs most commonly used in the considerations are italicized below and defined in a glossary in the Appendix. Note that content is designated at the cluster level when the guidance refers to the cluster and its standards, and at the standard level in cases where guidance varies within a cluster.

Considerations for Addressing PRIORITY Grade-Level Content	
The clusters and standards listed in this table name the priority instructional content for grade 6. The right-hand column contains approaches to shifting how time is dedicated to the clusters and standards in the left-hand column.	
Clusters/Standards	**Considerations**
6.RP.A	No special considerations for curricula well aligned to understanding ratio concepts and using ratio reasoning to solve problems, as detailed in this cluster. Time spent on instruction and practice should NOT be reduced.
6.NS.A	*Incorporate* foundational work on division with unit fractions and whole numbers (5.NF.B.7) in the early part of students' work on fraction division (6.NS.A).
6.NS.C	*Incorporate* foundational work on the coordinate plane (5.G.A.1) to support students' entry into this cluster.
6.EE.A	*Emphasize* equivalent expressions (6.EE.A.3 and 4), particularly the idea that applying properties of operations to an expression always results in an expression that is equivalent to the original one.
6.EE.B	No special considerations for curricula well aligned to reasoning about and solving one-variable equations and inequalities, as detailed in this cluster. Time spent on instruction and practice should NOT be reduced.
6.EE.C	No special considerations for curricula well aligned to this representing and analyzing quantitative relationships between dependent and independent variables, as detailed in this cluster. Time spent on instruction and practice should NOT be reduced.

Considerations for Addressing REMAINING Grade-Level Content	
The clusters and standards listed in this table represent the remainder of grade 6 grade-level content. The right-hand column contains approaches to shifting how time is dedicated to the clusters and standards in the left-hand column.	
Clusters/Standards	**Considerations**
6.NS.B.2 6.NS.B.3	*Eliminate* lessons on computing fluently (6.NS.B.2 and 3) by *integrating* these problems into spiraled practice throughout the year. To keep students on track to algebra and avoid inequitable remediation structures, time in grade 6 should not be spent remediating multi-digit calculation algorithms.
6.NS.B.4	No special considerations for curricula well aligned to common factors and multiples, including using distributive property for expressions, as detailed in this standard. Time spent on instruction and practice should not exceed what would be spent in a typical year.
6.G.A.1	*Emphasize* understanding of the reasoning leading to the triangle area formula; instead of teaching additional area formulas as separate topics, *emphasize* problems that focus on finding areas in real-world problems by decomposing figures into triangles and rectangles.
6.G.A.2	*Incorporate* foundational work on volume (5.MD.C) while working on volumes of right rectangular prisms with fractional edge lengths (6.G.A.2). *Emphasize* contextual problems, as detailed in the second sentence of the standard; *eliminate* lessons focused on the first sentence of the standard (finding the volume of a rectangular prism with fractional edge lengths by packing it with unit cubes).
6.G.A.3	*Eliminate* lessons and problems involving polygons on the coordinate plane.
6.G.A.4	*Eliminate* lessons and problems on constructing three-dimensional figures from nets and determining if nets can be constructed into three-dimensional figures during the study of nets and surface area.
6.SP.A	*Combine* lessons about introductory statistical concepts so as to proceed more quickly to applying and reinforcing these concepts in context. (Note that there are no procedural expectations in the cluster; no procedural practice is required to meet the expectations of the cluster.)
6.SP.B	*Reduce* the amount of required student practice in calculating measures of center and measures of variation by hand, to make room to emphasize the concept of a distribution and the usefulness of summary measures. *Reduce* the amount of time spent creating data displays by hand.

Facilitate Social, Emotional, and Academic Development (SEAD)[15] Through Grade-Level Content	
The left-hand column contains sample actions for how SEAD can be effectively integrated into grade-level mathematics instruction, in connection with Standards for Mathematical Practice named in the right-hand column. Efforts should be made to facilitate SEAD even in remote learning environments, using synchronous and asynchronous approaches and the capabilities afforded by remote learning technologies.	
Sample Actions	**Connection to Standards for Mathematical Practice (SMP)**
Build a safe community where mathematical discourse supports active listening, promotes diverse perspectives and insights, and allows students to consider others' reasoning to advance their own mathematical understanding. For example, utilize a "which one doesn't belong?" activity for groups of students to discuss and analyze correspondences between graphs, tables, and equations that represent a relationship between dependent and independent variables.	MP2: Reason abstractly and quantitatively.
Bring in students' existing funds of knowledge (culture, contexts, language, and experiences), such as during the study of ratios and rates, when students need to make sense of quantities and relationships in problem situations; they may bring in their understanding of measurement units to do measurement conversions and their real-life interactions with percents to solve percent problems.	MP2: Reason abstractly and quantitatively.
Position students as mathematically competent by encouraging students to construct mathematical arguments and engage in the reasoning of others, such as when they are using the properties of operations to generate equivalent expressions or working collaboratively to develop the formula for the area of a triangle through analyzing a variety of parallelograms and making an argument to generalize the relationship.	MP3: Construct viable arguments and critique the reasoning of others.

[15] Sample SEAD actions contribute to students' sense of belonging and safety, efficacy, value for effort and growth, as well as a sense of engagement in work that is relevant and culturally responsive. The actions can be modified to fit any grade, K–8, by considering the content of that grade level. See other grade-level Mathematics Instructional Priorities documents for additional samples.

6th Grade Math Important Prerequisites

Prerequisite Standard Address before or within grade-level instruction	Grade-Level Standard ■ Major ☒ Supporting ☒ Additional	Standard Language	Instructional Time Preserve or reduce time in 20-21 as compared to a typical year, per SAP guidance
5.NBT.A.2	■6.EE.A.1 *Procedural, Conceptual*	Write and evaluate numerical expressions involving whole-number exponents.	
5.OA.A.1, 5.OA.A.2, 5.OA.A.3	■6.EE.A.2 *Procedural, Conceptual*	Write, read, and evaluate expressions in which letters stand for numbers.	
	■6.EE.A.2a *Conceptual*	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.*	
	■6.EE.A.2b *Conceptual*	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.*	
	■6.EE.A.2c *Procedural, Application*	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). *For example, use the formulas V = s^3 and A = 6 s^2 to find the volume and surface area of a cube with sides of length s = 1/2.*	
	■6.EE.A.3 *Procedural, Conceptual*	Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*	
	■6.EE.A.4 *Conceptual*	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	
5.NF.A.1, 5.NF.A.2, 5.NF.B.4a-b,	■6.EE.B.5 *Conceptual, Procedural*	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	

5.NF.B.6	■6.EE.B.6 *Conceptual, Application*	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	
	■6.EE.B.7 *Application, Procedural*	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.B.8 *Conceptual, Application*	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.	
	■6.EE.C.9 *Application, Conceptual*	Use variables to represent two quantities in a real-world problem that change in relationship to one another; 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. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*	
	■6.G.A.1 *Procedural, Application*	Find area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	*Emphasize understanding of the reasoning leading to the triangle area formula. Instead of teaching additional area formulas as separate topics, emphasize problems that focus on finding areas in real-world problems by decomposing figures into triangles and rectangles.*
5.MD.C.4, 5.MD.C.5a-c	■6.G.A.2 *Conceptual, Procedural, Application*	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	*Emphasize contextual problems, as detailed in the second sentence of the standard; eliminate lessons focused on the first sentence of the standard (finding the volume of a rectangular prism with fractional edge lengths by packing it with unit cubes).*
5.G.A.1, 5.G.A.2	■6.G.A.3 *Application, Procedural*	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	*Eliminate lessons and problems involving polygons on the coordinate plane.*

	6.G.A.4 *Conceptual, Application, Procedural*	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	*Eliminate lessons and problems on constructing three-dimensional figures from nets and determining if nets can be constructed into three-dimensional figures during the study of nets and surface area.*
5.NF.B.7a-b	6.NS.A.1 *Conceptual, Procedural, Application*	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. [In general, (a/b) ÷ (c/d) = ad/bc.] How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*	
5.NBT.B.6	6.NS.B.2 *Procedural*	Fluently divide multi-digit numbers using the standard algorithm.	*Eliminate lessons on computing fluently by integrating these problems into spiraled practice throughout the year. Time should not be spent remediating multi- digit calculation algorithms.*
5.NBT.B.7	6.NS.B.3 *Procedural*	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	
	6.NS.B.4 *Conceptual, Procedural*	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 1-100 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).*	
	6.NS.C.5 *Conceptual, Application*	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 level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	
	6.NS.C.6 *Conceptual*	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	
	6.NS.C.6a *Conceptual*	Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.	
	6.NS.C.6b *Conceptual*	Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	

	■6.NS.C.6c *Procedural*	Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	
	■6.NS.C.7 *Conceptual*	Understand ordering and absolute value of rational numbers.	
	■6.NS.C.7a *Conceptual*	Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.*	
	■6.NS.C.7b *Conceptual, Application*	Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write -3C > -7C to express the fact that -3C is warmer than -7C.*	
	■6.NS.C.7c *Conceptual, Application*	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars.*	
	■6.NS.C.7d *Conceptual*	Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.*	
5.G.A.1, 5.G.A.2	■6.NS.C.8 *Application, Conceptual, Procedural*	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	
5.NF.B.5a-b	■6.RP.A.1 *Conceptual*	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."*	
5.NF.B.3 5.NF.B.5a-b	■6.RP.A.2 *Conceptual*	Understand the concept of a unit rate a/b associated with a ratio a:b with b not equal to 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*	
	■6.RP.A.3 *Application, Conceptual, Procedural*	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.	
5.G.A.1, 5.G.A.2	■6.RP.A.3a *Conceptual, Procedural*	Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	
	■6.RP.A.3b *Application*	Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*	

	6.RP.A.3c *Conceptual, Procedural, Application*	Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.	
	6.RP.A.3d *Conceptual, Procedural, Application*	Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	
	6.SP.A.1 *Conceptual*	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	*Combine lessons about introductory statistical concepts so as to proceed more quickly to applying and reinforcing these concepts in context.*
	6.SP.A.2 *Conceptual*	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	
	6.SP.A.3 *Conceptual*	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.	
	6.SP.B.4 *Application, Conceptual, Procedural*	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	*Reduce the amount of required student practice in calculating measures of center and measures of variation by hand, to emphasize the concept of a distribution and the usefulness of summary measures. Reduce the amount of time spent creating data displays by hand.*
	6.SP.B.5 *Application, Conceptual*	Summarize numerical data sets in relation to their context.	
	6.SP.B.5a *Application, Conceptual*	Summarize numerical data sets in relation to their context by reporting the number of observations.	
	6.SP.B.5b *Application, Conceptual*	Summarize numerical data sets in relation to their context by describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	
	6.SP.B.5c *Application, Conceptual, Procedural*	Summarize numerical data sets in relation to their context by giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), 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.	
	6.SP.B.5d *Application, Conceptual*	Summarize numerical data sets in relation to their context by 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.	

- **What should we make of standards that have an important prerequisite that needs to be addressed, but a reduction in instructional time is also recommended?** These considerations should be weighed together, along with the needs of your group of students. For example, the time spent on a standard might be reduced from five days to three days by de-emphasizing one part of the standard, but prior-grade needs might be addressed within the first lesson through strategic choice of tasks.

Category	Meaning	Example	Actions to take
Address **before** grade-level instruction	Without this prior knowledge, students most likely do not have a way to access the grade-level standard.	A 7th-grader who has not learned how to divide positive fractions (6.NS.A.1) needs to build that understanding before beginning to divide negative fractions (7.NS.A.2c).	Students may require **dedicated instruction** on prerequisite standards before the grade level instruction is taught. (Not every standard needs its own full lesson; multiple standards may be addressed at once, or a standard might be taught as a short mini-lesson.)
Address **within** grade-level instruction	Students will have an entry point into grade-level content, but will benefit from instruction that weaves in this prior-grade content.	A 4th-grader who struggles with recalling multiplication facts (3.OA.C.7) can still access grade-level, multi-step application problems (4.OA.A.3) when given a multiplication table, but will need small doses of continued support to attain fluency.	**Individual tasks or strategies** from these standards can be incorporated into grade-level lessons to address important content that was missed in the prior grade.

See Complete K-8 Documents here:

2020–21 Priority Instructional Content from Achieve the Core
https://achievethecore.org/content/upload/2020%E2%80%9321%20Priority%20Instructional%20Content%20in%20ELA%20Literacy%20and%20Mathematics_June%202020.pdf

Math Important prerequisite skills list from CCSSO:
https://docs.google.com/document/d/1mcApF1n7sPI7XsrIx29Ab_tmAAvne4A-VuJKSWb_qSg/edit