5th grade Mathematics Considerations from Achieve the Core/CCSSO

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

Grade 5 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 5.NBT.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 5 Mathematics?

College- and career-ready mathematics standards have important emphases at each grade level, which for grade 5 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 5. 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**
5.NBT.A	Allow for time to develop students' understanding of the foundational work of decimal fractions (4.NF.C) to support entry into understanding the place value system with decimals (5.NBT.A.1, 3, and 4).
5.NBT.B	*Incorporate* foundational work on multiplying and dividing multi-digit whole numbers (4.NBT.B.5 & 6) to support students' work operating with multi-digit whole numbers and decimals (5.NBT.B). In relation to fluency expectations for multiplying multi-digit numbers, *eliminate* problems in which either factor has more than three digits.
5.NBT.B.7	*Incorporate* students' understanding of decimal fractions (4.NF.C) to support entry into the grade 5 work of operations with decimals.
5.NF.A	*Incorporate* foundational work on equivalent fractions (4.NF.A.1) and on the conceptual understanding underlying fraction addition (4.NF.B.3) to support students' work on adding and subtracting fractions with unlike denominators (5.NF.A).
5.NF.B	*Incorporate* foundations for multiplying fractions by whole numbers (4.NF.B.4) to support students' work in multiplying fractions and whole numbers by fractions (5.NF.4).
5.MD.C	No special considerations for curricula well aligned to the work of volume in grade 5, as detailed in this cluster. Time spent on instruction and practice should NOT be reduced.
5.G.A	*Incorporate* foundational understandings of number lines (such as found in the work of 4.NF) into the work of extending number lines to the coordinate plane, as detailed in this cluster. *Emphasize* interpreting coordinate values of points in the context of a situation.

Considerations for Addressing REMAINING Grade-Level Content	
The clusters and standards listed in this table represent the remainder of grade 5 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**
5.OA.A	*Combine* lessons on writing and interpreting numerical expressions in order to reduce the amount of time spent on this topic.
5.OA.B	*Eliminate* lessons and problems on analyzing relationships between numerical patterns.
5.MD.A	*Combine* lessons on converting measurement units in order to reduce the amount of time spent on this topic.
5.MD.B	*Eliminate* lessons and problems on representing and interpreting data using line plots that do not strongly reinforce the fraction work of this grade (5.NF).
5.G.B	*Combine* lessons on classifying two-dimensional figures into categories based on properties in order to reduce the amount of time spent on this topic.

Facilitate Social, Emotional, and Academic Development (SEAD)[14] 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 community by providing group tasks to develop sense making and problem solving while deepening students' active engagement.	MP1: Make sense of problems and persevere in solving them.
Gather student perspectives through written or verbal reflection (for example, anticipation guides, exit slips, error analysis, interviews) so that students consider their learning, performance, and growth as learners.	MP3: Construct viable arguments and critique the reasoning of others.
Position students as mathematically competent by encouraging various entry points and elevating different ways students see and use structure in problems. For example, students might see a 3×4×5 rectangular prism as three layers of a 4×5 array of cubes, as four layers of a 3×5 array of cubes, or as five layers of a 3×4 array of cubes.	MP7: Look for and make use of structure.

[14] 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.

5th 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.G.A.1 *Conceptual*	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).	*Incorporate foundational understandings of number lines (such as found in the work of 4.NF) into the work of extending number lines to the coordinate plane, as detailed in this cluster. Emphasize interpreting coordinate values of points in the context of a situation.*
	■ 5.G.A.2 *Conceptual, Application, Procedural*	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	
4.G.A.1, 4.G.A.2	■ 5.G.B.3 *Conceptual*	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*	*Combine lessons on classifying two-dimensional figures into categories based on properties in order to reduce the amount of time spent on this topic.*
	■ 5.G.B.4 *Conceptual*	Classify two-dimensional figures in a hierarchy based on properties.	
4.MD.A.1	■ 5.MD.A.1 *Procedural, Application*	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step real world problems.	*Combine lessons on converting measurement units in order to reduce the amount of time spent on this topic.*
	■ 5.MD.B.2 *Application*	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*	*Eliminate lessons and problems on representing and interpreting data using line plots that do not strongly reinforce the fraction work of this grade (5.NF).*
	■ 5.MD.C.3 *Conceptual*	A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.	

	■5.MD.C.3a *Conceptual*	A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.	
	■5.MD.C.3b *Conceptual*	A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	
	■5.MD.C.4 *Conceptual, Procedural*	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	
	■5.MD.C.5 *Conceptual, Application, Procedural*	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	
	■5.MD.C.5a *Conceptual*	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.	
	■5.MD.C.5b *Procedural, Application*	Apply the formulas V = l x w x h and V = b x h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	
	■5.MD.C.5c *Conceptual, Application*	Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	
4.NBT.A.1, 4.NF.C.5, 4.NF.C.6, 4.NF.C.7	■5.NBT.A.1 *Conceptual*	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	*Allow for time to develop students' understanding on foundation work of decimal fractions (4.NF.C) to support entry into understanding the place value system with decimals (5.NBT.A.1, 2, and 4).*
	■5.NBT.A.2 *Conceptual, Procedural*	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole number exponents to denote powers of 10.	
4.NBT.A.2	■5.NBT.A.3 *Conceptual, Procedural*	Read, write, and compare decimals to thousandths.	
	■5.NBT.A.3a *Conceptual, Procedural*	Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.	
	■5.NBT.A.3b *Conceptual*	Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	

4.NBT.A.3	■5.NBT.A.4 *Conceptual, Procedural*	Use place value understanding to round decimals to any place.	
4.NBT.B.5, 4.OA.A.3	■5.NBT.B.5 *Procedural*	Fluently multiply multi-digit whole numbers using the standard algorithm.	*Incorporate foundational work on multiplying and dividing multi-digit whole numbers (4.NBT.B.5 & 6) to support students' work operating with multi-digit whole numbers and decimals (5.NBT.B). In relation to fluency expectations for multiplying multi-digit numbers, eliminate problems in which either factor has more than three digits.*
4.NBT.B.6, 4.OA.A.3	■5.NBT.B.6 *Conceptual, Procedural*	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	
4.NF.C.5, 4.NF.C.6, 4.NF.C.7, 4.OA.A.3	■5.NBT.B.7 *Conceptual, Procedural*	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	*Incorporate students' understanding of decimal fractions (4.NF.C) to support entry into the grade 5 work of operations with decimals.*
4.NF.A.1, 4.NF.B.3a-c	■5.NF.A.1 *Procedural*	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*	*Incorporate foundational work on equivalent fractions (4.NF.A.1) and on the conceptual understanding underlying fraction addition (4.NF.B.3) and to support students' work on adding and subtracting fractions with unlike denominators (5.NF.A).*
	■5.NF.A.2 *Application*	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7 by observing that 3/7 < 1/2.*	
	■5.NF.B.3 *Conceptual, Application*	Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3 and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. *If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	

4.NF.B.4a-b	■5.NF.B.4 *Conceptual, Procedural*	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	*Incorporate foundations for multiplying fractions by whole numbers (4.NF.B.4) to support students' work in multiplying fractions and whole numbers by fractions (5.NF.4).*
	■5.NF.B.4a *Conceptual, Application*	Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*	
	■5.NF.B.4b *Conceptual*	Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	
4.OA.A.1, 4.OA.A.2	■5.NF.B.5 *Conceptual*	Interpret multiplication as scaling (resizing), by:	
	■5.NF.B.5a *Conceptual*	Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.	
	■5.NF.B.5b *Conceptual*	Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (nxa) / (nxb) to the effect of multiplying a/b by 1.	
	■5.NF.B.6 *Application*	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	
	■5.NF.B.7 *Conceptual, Application, Procedural*	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.	
	■5.NF.B.7a *Conceptual, Application*	Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*	
	■5.NF.B.7b *Conceptual, Application*	Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.*	
	■5.NF.B.7c *Application*	Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*	

	5.OA.A.1 *Procedural*	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	*Combine lessons on writing and interpreting numerical expressions in order to reduce the amount of time spent on this topic.*
	5.OA.A.2 *Conceptual*	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	
	5.OA.B.3 *Conceptual, Procedural*	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	*Eliminate lessons and problems on analyzing relationships between numerical patterns.*

- **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