

Guidance Document - *GO Math!* Grade 5

This document provides guidance on how teachers can adjust their implementation of *GO Math!* to better meet the requirements of the Common Core State Standards or other College- and Career-Ready (CCR) standards. Guidance is provided at both the program and chapter levels and was developed through a collaboration between districts currently using *GO Math!* and Student Achievement Partners. Student Achievement Partners worked with districts across the country that appreciate the promise and potential of the *GO Math!* (K-5) comprehensive mathematics program from Houghton Mifflin Harcourt and that sought to align *GO Math!* more closely to the expectations of rigorous college- and career-ready standards. Student Achievement Partners worked with Houghton Mifflin Harcourt and teams of teachers from these districts to create guidance documents that leverage the program's strongest elements and, when used alongside *GO Math!*, provide teachers the resources to deliver aligned instruction in order to drive student outcomes.

Part 1: About Go Math!

Provides a summary of the program and an overall assessment of its strengths as well as areas that require attention to improve alignment.

Part 2: Program-Level Rules of Thumb

Program-level Rules of Thumb (RoT) provide alternate ways to use features that appear across the Go Math! program K-5. Some districts may want to begin by just sharing Part 2 with teachers and supporting them in making the RoT a part of their daily instructional practice.

Part 3: Grade-Level Rules of Thumb

Grade-level RoT provide grade-specific alternate ways to use features in each grade-level of GO Math!. It also includes a reference to the Fluency documents which provide supplemental resources to help students meet the fluency expectations at each grade level. Teachers may want to consult these at the beginning of the school year as they are mapping out their year.

Part 4: Chapter-Level Guidance

Chapter-level guidance includes recommendations for each lesson in all chapters for each grade-level K-5. Lessons can be deleted, modified or left as is. Sometimes, additional lessons are needed to fully reach the expectations of the standards; in these cases a link to a free resource is provided. Keep in mind that these lessons are often pulled from comprehensive programs and teachers will need to make decisions about which parts of the lessons to use. Rationale is provided for why each change has been suggested. By studying this rationale teachers can gain a better understanding of the standards and how to use the suggested resources. Teachers may want to consult each chapter-level guidance as part of a PLC before starting to teach the chapter.

Part One: About *GO Math!* (K-5)

A description of the strengths in alignment and implementation recommendations

GO Math! K-5, written to the Common Core State Standards, was first published by Houghton Mifflin Harcourt in 2012. Since its initial publication, a number of updates have been made in addition to the creation of some state-specific versions. For the most part, however, all of these editions and versions have very similar content and the same instructional approaches.

GO Math! has created a sequence of chapters and lessons in each grade that allows for the large majority of time to be on the Major Work of the grade. Generally, the content is aligned to the progression that is outlined in College and Career Ready (CCR) standards with little off-grade-level content and little material that unduly interferes with grade-level learning. Students using *GO Math!* will generally get the right content for the grade level, as outlined by the Standards.

Many lessons that focus on operations provide a mix of strategies and models to help students make sense of the work; however, these strategies and models are rarely connected to each other or used to advance student understanding towards later work they will be doing. For instance, work with addition and subtraction in 1st and 2nd grades includes a variety of representations and strategies that students must learn but does not highlight those strategies which are place-value based and will further students' understanding of the meaning and properties of the operations.

GO Math! provides opportunities for students to experience each aspect of Rigor (Conceptual Understanding, Procedural Skill and Fluency, and Application) required in instruction for students to be college- and career-ready¹. Two components of *GO Math!* that attempt to target Conceptual Understanding are “Math Talk” and “Unlock the Problem.” “Math Talk” generally provides quality conceptual discussion question for students. “Unlock the Problem,” however, is often overly scaffolded which means that students are not having authentic opportunities to make sense of problems and engage with mathematical ideas within lessons that address standards calling for Conceptual Understanding. Overall, the lessons attend to Fluency with addition/subtraction and multiplication/division facts as the focus of chapters and there is a “Fluency Builder” activity that shows up several times a week. However, the Fluency Builder activities do not always correlate to the fluency expectations of the grade level. More work is needed throughout the program to ensure that students meet the required fluencies of each grade. Application problems are provided in each lesson in the Problem Solving ♦ Application section. Many of these problems provide opportunities for students to apply mathematical ideas to real-world or mathematical problems. In addition, the “Problem of the Day” provides other opportunities for Application.


¹Student Achievement Partners, The Common Core State Standards Shifts in Mathematics
<http://achievethecore.org/page/900/the-common-core-state-standards-shifts-in-mathematics>

Part Two: Program-Level Rules of Thumb for *GO Math!* (K-5)

How should teachers use the features of the book to make instruction more aligned?

The Rules of Thumb below provide general guidance for how to leverage certain features of *GO Math!* to align the program to CCR standards with an emphasis on the Standards for Mathematical Practice (SMPs). Because the practice of teaching is about so much more than what is provided in instructional materials, the Rules of Thumb serve as general guidance. They are not meant to replace teacher judgement about exactly how to use the materials in every case. There may be times when the Rules of Thumb suggest omitting a certain feature but a teacher still chooses to use that feature sparingly based on the specific content or learning goal for a particular lesson. Note: Some of these features may be slightly different in the Kindergarten materials, as the program is structured a bit differently.


The Rules of Thumb are intended to help users make decisions about how to use the program in a way that is true to the intent of the SMPs. The current references to the SMPs in the program are sometimes inconsistent or inaccurate. By incorporating the recommendations below, it is much more likely that classroom instruction will allow opportunities for students to engage in the SMPs.

 Rule of Thumb	Rationale
<p>1) Daily Routines:</p> <p>Fluency Builder: Use only activities that are related to grade-level fluency expectations. See specific guidance on how to supplement in each grade-level document.</p> <p>Vocabulary Builder: Rather than doing this as a separate activity, incorporate vocabulary, where appropriate in daily lessons.</p>	<p>Fluency builder does not consistently match grade-level expectations for fluency. More consistent practice is needed to ensure students meet the fluency expectations of each grade level.</p> <p>MP.6: Vocabulary should be embedded in the lesson as students use and understand precise mathematical vocabulary. (See Rule 6 below)</p>
<p>2) Unlock the Problem/Listen and Draw: Present the problem to students without the scaffolding provided on the student-facing worksheet (e.g., project the problem on the board and have students solve in a math notebook.) Use the scaffolding to drive questions for students as they work and use strategies presented, including those in “Another Way” section as a frame for driving class discussion about student work. It may be also necessary to remove the scaffolding and prompts from the Share and Show that follow these features.</p>	<p>MP.1 requires students to make sense of and solve problems. MP.4 requires students to have opportunities to use mathematics to model problems.</p>

<p>3) Math Talk: These bubbles should be used for class discussion or writing prompts for students, especially when lessons align to standards that require Conceptual Understanding.</p>	<p>Students need opportunities to respond to conceptual discussion questions to meet the Standards' expectations for Conceptual Understanding.</p>
<p>4) Problem Solving ♦ Application (Real World): Make sure to allow time for students to do these problems, particularly when addressing standards that require Application. Go Deeper/Think Smarter generally provide problems that make a good basis for conceptual discussions. Use these for discussion, particularly when addressing standards that require Conceptual Understanding.</p>	<p>MP.3 requires that students have opportunities to construct arguments and critique the reasoning of others which can happen during discussions about these problems.</p>
<p>5) Approach to Strategies and Models for Operations: Provide more opportunities than are currently offered for students to choose which strategies, representations, and models they use to solve problems. In some cases, this may mean presenting problems that require specific strategies, representations, and models without suggesting or providing those supports outright. [See Chapter Rules of Thumb for more specific guidance at each grade level.]</p> <p>Note: This Rule is not saying that strategies, representations, and models should be excluded from instruction. Consistent with the Standards, all are helpful in building students' understanding of the mathematics. The Rule is intended to incorporate the language of MP.5 and ensure that students ultimately are expected to make choices about which tools to use to solve problems instead of too often being given specific tools within the problems.</p>	<p>Many standards offer examples or choices for models or representations to use to perform operations or solve problems (e.g., 2.NBT.B.7: Add and subtract within 1000, 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). As articulated in MP.5, students should "make sound decisions about when...tools might be helpful."</p>
<p>6) General Approach to Vocabulary: Do not use the Developing Math Language section in the front matter of each chapter. While the listed vocabulary words may be useful in some cases, definitions can be inaccurate or go above grade-level expectations. Vocabulary Strategy sections distract from the work of the grade. Vocabulary instruction should be integrated into the work of the lesson.</p> <p>Skip Vocabulary Builders/Games/Write Way at the beginning of each chapter. This distracts from the work of the grade.</p>	<p>MP.6 requires students to use precisions in their mathematical communication. However, the program tends to treat vocabulary as a topic to be taught separately rather than as part of the work of the content standards and MPs. Integrating vocabulary work into the lessons will allow students to communicate precisely and accurately about their mathematical ideas.</p>
<p>7) Assessment:</p> <ul style="list-style-type: none"> • Eliminate any questions aligned to lessons/content that has been deleted. • Add in vetted questions that are aligned to lessons that have been added. • Remove any directions in questions that require a specific strategy or model. <p>For corresponding edits to the chapter tests, please see the Chapter Test Alignment.</p>	<p>Alignment to content standards</p>

Part Three: Grade-Level Rules of Thumb for *GO Math!* (Grade 5)

What should teachers think about throughout the course of the year specifically for Grade 5 to make instruction more aligned?


 Rule of Thumb	Rationale
Use the Grade 5: Resources for Developing Grade-Level Fluencies to provide distributed practice with the standard algorithm for multiplication.	5.NBT.B.5 requires students to fluently multiply multi-digit whole numbers using the standard algorithm
For corresponding edits to the chapter tests, please see the Chapter Test Alignment .	

Part Four: Chapter-Level Guidance for *GO Math!* (Grade 5)

How can teachers implement each chapter of Grade 5 to make instruction more aligned by making minor modifications and supplementing Open Educational Resources (OER)?

Grade 5 / Chapter 1: Place Value, Multiplication, and Expressions			
Lesson	Action	Details for the Action	Rationale
1.1 Place Value and Patterns	As is		
1.2 Place Value of Whole Numbers	Delete		Aligns to 4.NBT.A.2
1.3 Place Value of Whole Numbers	Delete		Aligns to 3.OA.B.5
1.4 Powers of 10 and Exponents	As is		
1.5 Multiplication Patterns	As Is		
1.6 Multiply by 1-Digit Numbers	As Is		
1.7 Multiply by Multi-Digit Numbers	As Is		
1.7.1	Add	Practice multi-digit multiplication: Engage NY, Module 2, Lesson 8	Students need more practice to reach the expectation of 5.NBT.B.5 which requires fluently multiplying multi-digit whole numbers using the standard algorithm.
1.8 Relate Multiplication to Division	As is		


1.9 Multiplication and Division	Delete		5.NBT.B.6 requires students to use strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. The lesson focuses on a strategy that does not align to these expectations.
1.10 Numerical Expressions	As Is		
1.11 Evaluate Numerical Expressions	As is		
1.12 Grouping Symbols	Delete		5.OA.A.1 does not require nested parentheses, brackets, and braces.

 Chapter 1 Rules of Thumb	Rationale
Follow program Rules of Thumb and integrate vocabulary, including properties of operations, throughout the chapter where appropriate.	MP.6 requires students to be precise in their mathematical language.
Connect standard algorithm to the area model to connect the procedural skill requirement of Grade 5 to conceptual understanding developed in previous grades.	Students have been working to connect place value understanding to the operations in the NBT and OA domains. 5.NBT.B.5 and 5.NBT.B.6 provide a capstone of this work.

Grade 5 / Chapter 2 Divide Whole Numbers

Lesson	Action	Details for the Action	Rationale
2.1 Place the First Digit	Delete		5.NBT.B.6 requires students to use strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. The strategy presented in this lesson does not meet those expectations.
2.2 Divide by 1-Digit Divisors	As is		
2.2.1	Add	Practice division with dividends up to 4-digits and 1-digit divisors using any strategy: Divide 2-to-4 Digit by 1-Digit Number	Students need additional practice to meet the expectations of 5.NBT.B.6 which requires students to 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.
2.3 Division with 2-Digit Divisors	Delete		5.NBT.B.6 requires conceptual understanding. This lesson creates a procedure using base ten blocks that doesn't allow student to use strategies named in the standard.
2.3.1	Add	Lesson using area models for multi-digit division: LearnZillion, Use an Area Model of 4-digit dividends by 2 digit divisors	5.NBT.B.6 suggests an area model for students to use to illustrate and explain their work of dividing two-digit dividends by two-digit divisors.
2.3.2	Add	Use Lesson 2.5	Moving Lesson 2.5 here will allow students to use estimation as a strategy as they work with partial quotients in Lesson 2.4.
2.4 Partial Quotients	As is		


2.5 Estimate with 2-Digit Divisors	Delete		Moved prior to Lesson 2.4.
2.6 Divide by 2-Digit Divisors	As is		
2.7 Interpret the Remainder	As is		
2.8 Adjust Quotients	As is		
2.9 Division	As is		

 Chapter 2 Rule of Thumb	Rationale
There are no chapter-specific Rules of Thumb. Be sure to still apply grade- and program-level Rules of Thumb from Part Two and Part Three of this document.	

Grade 5 / Chapter 3: Add and Subtract Decimals


Lesson	Action	Details for the Action	Rationale
3.1 Thousandths	As is		
3.2 Place Value of Decimals	As is		
3.2.1	Add	Lesson about naming decimals in expanded, unit and word form: EngageNY, Module 1, Lesson 5	Additional lesson supports deeper conceptual understanding required in 5.NBT.A.3a.
3.3 Compare and Order Decimals	As is		
3.4 Round Decimals	Delete		5.NBT.A.4 requires students to use place value understanding to round; this lesson uses a trick.
3.4.1	Add	Lesson about using number lines and place value to round a given decimal number. EngageNY Module 1, Lesson 7	5.NBT.A.4 requires students to use place value understanding to round.
3.5 Decimal Addition	As is		
3.6 Decimal Subtraction	As is		
3.7 Estimate Decimal Sums and Differences	Delete		5.NBT.B.7 does not require estimation.
3.8 Add Decimals	As is		
3.9 Subtract Decimals	As is		
3.10 Patterns with Decimals	Delete		5.NBT.B.7 does not require pattern work.

<p>3.11 Add and Subtract Money 3.12 Choose a Method</p>	<p>Modify</p>	<p>Condense these lessons. Emphasize the work of 3.12 and use 1-2 problems from 3.11. <i>[Note: The title and essential question for 3.12 are misleading, as the actual point of the lesson is to provide extra practice using strategies or algorithms.]</i></p>	<p>5.NBT.B.7 does not require application.</p>
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 Chapter 3 Rules of Thumb	Rationale
<p>Apply the program Rule of Thumb for general approach to vocabulary. In this chapter, emphasize correct meaning and use of key vocabulary: digits, value, place, and place value.</p> <p>Note: The concept of place value provides us with a way to write numbers in a succinct manner (i.e., instead of writing that I have 3 hundredths and 4 tenths, I can write .43). In the number .43, the “3” is a digit; it is in the hundredths place, and it carries a value of .03.</p>	<p>5.NBT.B.7 suggests students use strategies based on place value. By attending to precision as required by MP.6, students will connect their addition and subtraction work to place value concepts.</p>
<p>Throughout the unit, encourage students to think about the value of the digits in each number. Use the guidance from <i>Teaching in Depth</i>: “Tell students to ‘line up [digits that have the same] place values’ when they compute with decimals. Do not tell them to ‘line up decimal points’ - that is just a result of lining up [digits with the same] place values”</p>	
<p>Where appropriate, use concrete models or drawings, such as base ten blocks and Go Math iTools.</p>	<p>5.NBT.B.7 requires using concrete models or drawings.</p>
<p>As students are developing the concepts and skills of adding and subtracting decimals, highlight student work that uses the relationship between addition and subtraction to solve problems.</p>	<p>5.NBT.B.7 suggests using the relationship between addition and subtraction as a strategy for computation.</p>


Grade 5 / Chapter 4: Multiply Decimals

Lesson	Action	Details for the Action	Rationale
4.1 Algebra Multiplication Patterns with Decimals	As is		
4.2 Multiply Decimals and Whole Numbers	As is		
4.3 Multiplication with Decimals and Whole Numbers	As is		
4.4 Multiply Using Expanded Form/ 4.5 Multiply Money	Modify	Condense these lessons. Emphasize the work of 4.4 and use 1-2 problems from 4.5.	5.NBT.B.7 does not require application.
4.6 Decimal Multiplication	As is		
4.7 Multiply Decimals	As is		
4.8 Zeros in the Product	As is		

 Chapter 4 Rule of Thumb	Rationale
Provide opportunities for students to explain patterns in their computation, and to use that understanding to place decimal point in products. Encourage students to justify the reasonableness of their answers.	As students compute with decimals, they should fully engage with 5.NBT.B.7 by looking for structure in products (MP.7). 5.NBT.B.7 also requires students to explain the reasonableness of their computation (MP.3).

Grade 5 / Chapter 5: Divide Decimals


Lesson	Action	Details for the Action	Rationale
5.1 Division Patterns with Decimals	As is		
5.2 Divide Decimals by Whole Numbers	As is		
5.3 Estimate Quotients	As is		
5.4 Division of Decimals by Whole Numbers	As is		
5.5 Decimal Divisions	As is		
5.6 Divide Decimals	As is		
5.7 Write Zeros in the Dividend	As is		
5.8 Decimal Operations	Modify	“Chapter at a Glance” in some editions notes this lesson as 1-2 days. Spend only 1 day on this lesson.	5.NBT.B.7 does not specifically require application, although this is a plausible connection between the NF and OA domain. Because of this, less time should be spent on application problems.

 Chapter 5 Rules of Thumb	Rationale
Provide opportunities for students to explain patterns in their computation and to use that understanding to place decimal point in quotients. Encourage students to justify the reasonableness of their answers.	As students compute with decimals, they should fully engage with 5.NBT.B.7 by looking for structure in quotients. MP.7 requires students to attend to precision. 5.NBT.B.7 also requires students to explain the reasonableness of their computation. MP.3 requires students to construct viable arguments and critique the reasoning of others.
Connect students' prior work with whole number division using partial quotients to decimal division.	5.NBT.7 requires use of properties of operations and the relationship between multiplication and division when dividing decimals.

Grade 5 / Chapter 6: Operations with Fractions

Lesson	Action	Details for the Action	Rationale
6.1 Addition with Unlike Denominators	As is		
6.2 Subtraction with Unlike Denominators	As is		
6.3 Estimate Fraction Sums and Differences	As is		
6.4 Common Denominators and Equivalent Fractions	As is		
6.5 Common Denominators and Equivalent Fractions	As is		
6.6 Add and Subtract Mixed Numbers	As is		
6.7 Subtraction with Renaming	As is		
6.8 Patterns with Fractions	Delete		5.NF.A.1 does not require students to reduce fractions to the simplest form.
6.9 Practice Addition and Subtraction	As is		

6.9.1	Add	Lesson for more practice solving word problems: EngageNY, Grade 5, Module 3, Lesson 7	5.NF.A.2 is part of the Major Work of the grade. This additional day provides students with more practice solving word problems.
6.10 Use Properties of Addition	As is		

 Chapter 6 Rules of Thumb	Rationale
Do not require students to consistently write fractions in simplest form.	The Standards do not require the simplified form of a fraction; however, students should fluently find equivalent fractions. “There is no mathematical reason why fractions must be written in simplified form, although it may be convenient to do so in some cases.” (NF Progression, p. 6).
Apply the program Rule of Thumb and encourage students to use strategies for adding and subtracting mixed numbers by replacing given fractions with equivalent fractions rather than a specific procedure.	5.NF.A requires students to use equivalent fractions as a strategy to add and subtract fractions.

Grade 5 / Chapter 7: Multiply Fractions

Grade 5 / Chapter 8: Divide Fractions

A Note on Chapters 7 and 8: Unlike other chapters, which needed minor adjustments in order to meet the Standards, the working team found several serious areas of misalignment between the expectations of the Standards and the approach of the *GO Math!* lessons for Chapters 7 and 8.

These issues included:

- A lack of opportunities for students to apply and extend previous understandings of multiplication and division to multiply and divide fractions as called for by 5.NF.B
- Introducing a standard algorithm to multiply and divide fractions without taking time to develop conceptual understanding of the operations
- Lack of time spent developing the concept of multiplication as scaling as called for by 5.NF.B.5
- Introducing models and strategies that don't build conceptual understanding (e.g., circle models for multiplying and estimating or guessing to find missing factors)
- Lack of time for students to develop the knowledge and skills needed for 5.NF.B which is Major Work of Grade 5.

Although there are lessons within these chapters that meet the expectations of the Standards, there would need to be a lot of modifying, deleting, and adding to make the chapters fully align. The decision was made to replace the chapters in order to provide a coherent learning trajectory for both teachers and students.

Note: The lessons that are added come from an EngageNY module that integrates work with measurement conversions (5.MD.A.1) with fraction operations.


Lesson	Action	Details for the Action	Rationale
Chapters 7 and 8	Delete		5.NF.B sets an expectation for students to apply previous understanding of multiplication and division to multiply and divide fractions with many of the standards focused on building students' conceptual understanding of multiplying fractions prior to moving to the standard algorithm. 5.NF.B.5 requires interpreting multiplication as scaling. The cluster does not require students to use estimation or guessing to find missing factors or use circle models. As Major Work of Grade 5, ample time must be spent on multiplying and dividing fractions.

7.0.1	Add	Lesson about interpreting a fraction in context as a numerator and denominator: EngageNY, Module 4, Lesson 2	<p>5.NF.B sets an expectation for students to apply previous understanding of multiplication and division to multiply and divide fractions with many of the standards focused on building students' conceptual understanding of multiplying fractions prior to moving to the standard algorithm. 5.NF.B.5 requires interpreting multiplication as scaling. The cluster does not require students to use estimation or guessing to find missing factors or use circle models. As Major Work of Grade 5, ample time must be spent on multiplying and dividing fractions.</p>
7.0.2	Add	Lesson about interpreting fractions as division: EngageNY, Module 4, Lesson 3	
7.0.3	Add	Lesson about using tape diagrams to visualize the placement of fractions: EngageNY, Module 4, Lesson 4	
7.0.4	Add	Lesson about solving word problems involving the division of whole numbers with answers in the form of fractions or whole numbers: EngageNY, Module 4, Lesson 5	
7.0.5	Add	Lesson about exploring fractions of a set and conversion of units: EngageNY, Module 4, Lesson 6	
7.0.6	Add	Lesson about multiplying any whole number by a fraction using tape diagrams: EngageNY, Module 4, Lesson 7	
7.0.7	Add	Lesson about relating a fraction of a set to the repeated addition interpretation of fraction multiplication; EngageNY, Module 4, Lesson 8	
7.0.8	Add	Lesson about finding a fraction of a measurement, and solving word problems: EngageNY, Module 4, Lesson 9	

7.0.9	Add	Lesson about comparing expressions in word and numerical forms and with parenthesis: EngageNY, Module 4, Lesson 10	<p>5.NF.B sets an expectation for students to apply previous understanding of multiplication and division to multiply and divide fractions with many of the standards focused on building students' conceptual understanding of multiplying fractions prior to moving to the standard algorithm.</p> <p>5.NF.B.5 requires interpreting multiplication as scaling. The cluster does not require students to use estimation or guessing to find missing factors or use circle models. As Major Work of Grade 5, ample time must be spent on multiplying and dividing fractions.</p>
7.0.10	Add	Lesson about solving and creating fraction word problems involving addition, subtraction, and multiplication: EngageNY, Module 4, Lesson 11	
7.0.11	Add	Lesson about continuing to solve and create fraction word problems involving addition, subtraction, and multiplication: EngageNY, Module 4, Lesson 12	
7.0.12	Add	Lesson about multiplying unit fractions by unit fractions: EngageNY, Module 4, Lesson 13	
7.0.13	Add	Lesson about multiplying unit fractions by non-unit fractions: EngageNY, Module 4, Lesson 14	
7.0.14	Add	Lesson about multiplying non-unit fractions by non-unit fractions: EngageNY, Module 4, Lesson 15	
7.0.15	Add	Lesson about solving word problems using tape diagrams and fraction-by-fraction multiplication: EngageNY, Module 4, Lesson 16	
7.0.16	Add	Lesson about relating decimal and fraction multiplication: EngageNY, Module 4, Lesson 17	


7.0.17	Add	Lesson about continuing to relate decimal and fraction multiplication: EngageNY, Module 4, Lesson 18	<p>5.NF.B sets an expectation for students to apply previous understanding of multiplication and division to multiply and divide fractions with many of the standards focused on building students' conceptual understanding of multiplying fractions prior to moving to the standard algorithm. 5.NF.B.5 requires interpreting multiplication as scaling. The cluster does not require students to use estimation or guessing to find missing factors or use circle models. As Major Work of Grade 5, ample time must be spent on multiplying and dividing fractions.</p>
7.0.18	Add	Lesson about converting measures involving whole numbers, and solving multi-step word problems: EngageNY, Module 4, Lesson 19	
7.0.19	Add	Lesson about converting mixed unit measurements, and solving multi-step word problems: EngageNY, Module 4, Lesson 20	
7.0.20	Add	Lesson about explaining the size of the product, and relating fraction and decimal equivalence to multiplying a fraction by 1: EngageNY, Module 4, Lesson 21	
7.0.21	Add	Lesson about comparing the size of the product to the size of the factors: EngageNY, Module 4, Lesson 22	
7.0.22	Add	Lesson about continuing to compare the size of the product to the size of the factors: EngageNY, Module 4, Lesson 23	
7.0.23	Add	Lesson about solving word problems using fraction and decimal multiplication: EngageNY, Module 4, Lesson 24	
7.0.24	Add	Lesson about dividing a whole number by a unit fraction: EngageNY, Module 4, Lesson 25	

7.0.25	Add	Lesson about dividing a unit fraction by a whole number: EngageNY, Module 4, Lesson 26	5.NF.B sets an expectation for students to apply previous understanding of multiplication and division to multiply and divide fractions with many of the standards focused on building students' conceptual understanding of multiplying fractions prior to moving to the standard algorithm. 5.NF.B.5 requires interpreting multiplication as scaling. The cluster does not require students to use estimation or guessing to find missing factors or use circle models. As Major Work of Grade 5, ample time must be spent on multiplying and dividing fractions.
7.0.26	Add	Lesson about solving problems involving fraction division: EngageNY, Module 4, Lesson 27	
7.0.27	Add	Lesson about writing equations and word problems corresponding to tape and number line diagrams: EngageNY, Module 4, Lesson 28	
7.0.28	Add	Lesson about connecting division by a unit fraction to division by 1 tenth and 1 hundredth: EngageNY, Module 4, Lesson 29	
7.0.29	Add	Lesson about dividing decimal dividends by non-unit decimal divisors: EngageNY, Module 4, Lesson 30	
7.0.30	Add	Lesson about continuing to divide decimal dividends by non-unit decimal divisors: EngageNY, Module 4, Lesson 31	
7.0.31	Add	Lesson about interpreting and evaluating numerical expressions including the language of scaling and fraction division: EngageNY, Module 4, Lesson 32	
7.0.32	Add	Lesson about creating story contexts for numerical expressions and tape diagrams, and solving word problems: EngageNY, Module 4, Lesson 33	

 Chapter 7/8 Rule of Thumb	Rationale
There are no chapter-specific Rules of Thumb. Be sure to still apply grade- and program-level Rules of Thumb from Part Two and Part Three of this document.	.


Grade 5 / Chapter 9: Algebra: Patterns and Graphing

Lesson	Action	Details for the Action	Rationale
9.1 Line Plot	Modify	Skip all questions that ask students to calculate the average.	Finding averages aligns to 6.SP.B.5c.
9.1.1	Add	Practice with creating line plots and analyzing data that requires fraction operations: EngageNY, Module 4, Lesson 1	Allows for connecting Supporting Work (5.MD.B.2) to Major Work (5.NF).
9.2 Ordered Pairs	As is		
9.2.1	Add	Lesson about graphing and naming points on the coordinate plane, including fractional locations: EngageNY, Module 6, Lesson 3	
9.3 Graph Data	Delete		This lesson's focus on line graphs, which are not a requirement for Grade 5, and detracts from the central concern of 5.G.A.
9.4 Line Graphs	Delete		Line graphs are not a requirement of either the 5.G or 5.MD domain.
9.5 Numerical Patterns	As is		
9.6 Find a Rule	Modify	Do not ask students to write a rule to represent the pattern; focus on generating, extending, and comparing patterns.	5.OA.B.3 requires students to generate a pattern from given rules, not create a rule for a pattern.
9.7 Graph and Analyze Relationships	As is		

 Chapter 9 Rule of Thumb	Rationale
Give students opportunities to graph and name coordinate points that include fractions, as well as whole numbers.	Builds coherence between 5.G.A and 3.NF and sets students up for work in middle school involving the entire rational number system.

Grade 5 / Chapter 10: Converting Units of Measurement

Lesson	Action	Details for the Action	Rationale
10.1 Customary Length/ 10.2 Customary Capacity/ 10.3 Weight	Modify	Condense these 3 lessons into 1-2 days, mixing up the problems on the different attributes of measurement.	These lessons can be combined to help students to make connections between converting, regardless of the unit, and to shorten the amount of time spent on the Additional cluster 5.MD.A.
10.4 Multi Step Measurement Problems	As is		
10.5 Multi Step Measurement Problems	As is		
10.6 Customary and Metric Conversions	As is		
10.7 Elapsed Time	As is		


 Chapter 10 Rule of Thumb	Rationale
There are no chapter-specific Rules of Thumb. Be sure to still apply grade- and program-level Rules of Thumb from Part Two and Part Three of this document.	

Grade 5 / Chapter 11: Geometry and Volume*

Lesson	Action	Details for the Action	Rationale
11.1 Polygons	As is		
11.2 Triangles	As is		
11.3 Quadrilateral	As is		
11.4 Three-Dimensional Figures	Delete		Three-dimensional figures are not part of Grade 5 standards.
11.5 Unit Cubes and Solid Figures	As is		
11.6 Understand Volume	As is		
11.7 Estimate Volume	Delete		
11.8 Volume of Rectangular Prisms	As is		
11.9 Apply Volume Formulas	As is		
11.10 Compare Volumes	As is		
11.11 Find Volume of Composed Figures	Modify	Classroom examples and discussion should focus on the examples that recognize volume as additive rather than subtractive.	5.MD.C.5c requires student to recognize volume as additive.

11.11.1	Add	Practice solving application problems involving composite figures. Resources: <ul style="list-style-type: none"> • LearnZillion, Unit 9, Lesson 8 • LearnZillion, Unit 9, Lesson 9 <i>[Note: Use problems that feature figures composed of two right rectangular prisms]</i>	5.MD.C.5c requires students to solve real world problems by finding the volume of solid figures composed of two right rectangular prisms.
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*Some editions of *GO Math!* Grade 5, like the Florida-specific version, have a slightly different sequence for Chapter 11. Please use the lesson titles to help determine the adaptations that need to be made.

 Chapter 11 Rule of Thumb	Rationale
When students are counting unit cubes to find volume, give problems where the side length are not given.	5.MD.C.3 requires students to build a conceptual understanding of volume and how cubic units define the volume of a figure.