Guidance Document - *GO Math!* Grade 3

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-ready[1]. 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.

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[1]Student 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**
1) Daily Routines: **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. **Vocabulary Builder**: Rather than doing this as a separate activity, incorporate vocabulary, where appropriate in daily lessons.	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. MP.6: Vocabulary should be embedded in the lesson as students use and understand precise mathematical vocabulary.
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.	MP.1 requires students to make sense of and solve problems. MP.4 requires students to have opportunities to use mathematics to model problems.

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.	Students need opportunities to respond to conceptual discussion questions to meet the Standards' expectations for Conceptual Understanding.
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.	MP.3 requires that students have opportunities to construct arguments and critique the reasoning of others which can happen during discussions about these problems.
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.] **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.	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."
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. Skip **Vocabulary Builders/Games/Write Way** at the beginning of each chapter. This distracts from the work of the grade.	MP.6 requires attending to precision. 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.
7) Assessment: • 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.	Alignment to content standards

Part Three: Grade-Level Rules of Thumb for *GO Math!* (Grade 3)

What should teachers think about throughout the course of the year specifically for Grade 3 to make instruction more aligned?

| 👍 **Rule of Thumb**	**Rationale**
Use the **Grade 3: Resources for Developing Grade-Level Fluencies** to provide distributed practice on multiplication facts.	3.OA.C.7 requires students to know from memory all products of two one-digit numbers, by the end of Grade 3.
Use the **Grade 3: Resources for Developing Grade-Level Fluencies** to provide distributed practice on multi-digit addition and subtraction	3.NBT.A.2 requires students to fluently add and subtract within 1000.
For corresponding edits to the chapter tests, please see the Chapter Test Alignment.	

Part Four: Chapter-Level Guidance for *GO Math!* (Grade 3)

How can teachers implement each chapter of Grade 3 to make instruction more aligned by making minor modifications and supplementing Open Educational Resources (OER)?

Grade 3 / Chapter 1: Addition and Subtraction			
Lesson	**Action**	**Details for the Action**	**Rationale**
1.1 Number Patterns	Delete		Aligns to 1.OA.B.3 and 2.OA.C.3.
1.2 Round to the Nearest Ten or Hundred	As is		
1.3 Estimate Sums	Modify	Do not introduce compatible number strategies.	3.NBT.A.1 requires using place value understanding to the nearest 10 or 100.
1.4 Mental Math Strategies for Addition	Delete		3.NBT.A.2 requires students to fluently add and subtract within 1000. Numbers in the lesson do not move students toward fluency with the size of numbers expected for Grade 3.
1.5 Use Properties to Add	Delete		Aligns to 2.NBT.B.6
1.6 Use the Break Apart Strategy to Add 1.7 Use Place Value to Add	Modify	Condense these lessons to make the connection between breaking apart to add and the standard algorithm.	Lesson 1.6 aligns better to 2.NBT.B.7 since it is relying on place value understanding. Combining the lessons allows students to develop the understanding that the algorithm is based on place value that is required in 3.NBT.A.2.

1.7.1	Add	Practice with adding numbers out of context: LearnZillion Unit 3, Lesson 7 Extra practice with addition computation to meet fluency expectations: ● Add a three-digit and two-digit number so that the total is within 1000 ● Add two three-digit numbers so that the total is within 1000	Need more practice to reach the fluency requirements of 3.NBT.A.2 and application requirements of 3.OA.D.8
1.8 Estimate Differences	Modify	Do not introduce compatible number strategies.	3.NBT.A.1 requires using place value understanding to the nearest 10 or 100.
1.9 Mental Math Strategies for Subtraction	Delete		3.NBT.A.2 requires students to fluently add and subtract within 1000. Numbers in the lesson do not move students toward fluency with the size of numbers expected for Grade 3.
1.10 Use Place Value to Subtract	As is		
1.11 Combine Place Values to Subtract	As is		
1.11.1	Add	Practice with subtraction computation to meet fluency expectations. Resources: ● Subtract 2-Digit from 3-Digit Number with Regrouping ● Subtract 3-digit from 3-digit number ● Subtract 3-Digit from 3-Digit Number with Regrouping ● Balance the 3-Digit Addition or Subtraction Equation	Need more practice to reach the fluency requirements of 3.NBT.A.2 and application requirements of 3.OA.D.8
1.12 Model Addition and Subtraction	Delete		Numbers are smaller than Grade 3 expectations (3.NBT.A.2 and 3.OA.D.8).

1.12.1	Add	Practice with one- and two-step word problems involving addition and subtraction. Resources: • Two-step word problems	Need more practice to meet application expectations of 3.OA.D.8

👍 **Chapter 1 Rules of Thumb**	**Rationale**
Do not introduce rounding strategies that are purely procedural. Make sure that rounding strategies are always based on place value.	3.NBT.A.1 requires rounding to be based on place value.
Highlight the connection between standard algorithm and place value.	3.NBT.A.2 requires that students use strategies and algorithms based on place value, so that should be emphasized throughout the chapter.

Grade 3 / Chapter 2: Represent and Interpret Data

Lesson	Action	Details for the Action	Rationale
2.1 Organize Data	Delete		Graphing aligns to 2.MD.D.10 ; tally mark charts are not an expectation of the standards.
2.2 Use Picture Graphs 2.3 Make Picture Graphs	Modify	Condense these lessons, placing strong emphasis on 2.2 which requires students to answer questions based on the graphs.	3.MD.B.3 is Supporting Work; focusing on 2.2 will allow to strongly connect to 3.OA,D.8.
2.4 Use Bar Graphs 2.5 Make Bar Graphs	Modify	Condense these lessons, placing strong emphasis on 2.4 which requires students to answer questions based on the graphs	3.MD.B.3 is Supporting Work; focusing on 2.4 will allow to strongly connect to 3.OA,D.8.
2.6 Solve Problems Using Data	As is		
2.7 Use and Make Line Plots	As is		

🖎 Chapter 2 Rule of Thumb	Rationale
Older versions may need more two-step problems about the data. (This doesn't seem to be an issue in the 2015 version.)	3.MD.B.3 requires students to solve two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Grade 3 / Chapter 3: Understand Multiplication

Lesson	Action	Details for the Action	Rationale
3.1 Count Equal Groups	As is		
3.2 Relate Addition and Multiplication	As is		
3.3 Skip Count on a Number Line	Delete		Number line is not a requirement of 3.OA.A or 3.OA.B work. The abstract representation does not allow students to develop an understanding of the meaning of multiplication as defined in 3.OA.A.1.
3.4 Model Multiplication	Delete	Move to Chapter 4.	Allows lesson to be used to more fully develop 3.OA.D.8
3.4.1	Add	Lesson about connecting equal groups to arrays: EngageNY, Module 1, Lesson 2	3.OA.A.3 requires working with arrays. This lesson ties arrays to the meaning of multiplication defined in 3.OA.A.1
3.5 Model with Arrays 3.6 Commutative Property of Multiplication	Modify	Condense the lessons; be sure to use the Math Talks in both lessons. Read "Using Arrays to Model Multiplication" in Lesson 3.5 for more context.	3.OA.B.5 requires that students need to apply properties; condensing the lessons will allow students to use the commutative property in the context of multiplication work..
3.7 Multiply with 1 and 0	As is		

	Chapter 3 Rule of Thumb	Rationale
	Throughout the chapter, hold students to the meaning of each factor, as defined in the standard.	3.OA.A.1 requires students to interpret 5×7 as the total number of objects in 5 groups of 7 objects each.

Grade 3 / Chapter 4: Multiplication Facts and Strategies

Lesson	Action	Details for the Action	Rationale
4.1 Multiply with 2 and 4	As is		These lessons are misaligned. They are developing fluency and should be tagged to 3.OA.7.
4.2 Multiply with 5 and 10	As is		
4.3 Multiply with 3 and 6	As is		
4.3.1	Add	Lesson about the concept of distributive property: EngageNY, Module 1, Lesson 9	3.MD.C.7c requires students to understand and apply the distributive property using models.
4.3.2	Add	Lesson about connecting arrays to the distributive property: Engage NY, Module 1, Lesson 10	
4.4 Distributive Property 4.5 Multiply with 7	Modify	Condense the lessons to allow students to apply the distributive property to multiplication work.	3.OA.B.5 requires students to apply properties; condensing the lessons will allow students to use the distributive property in the context of multiplication work..
4.6 Associative Property of Multiplication	Delete		3.OA.B.5 requires to apply properties; it is unnecessary to teach separate lessons on properties. Rule of Thumb on Vocabulary will ensure teachers develop vocabulary around properties in the context of mathematical work.
4.7 Patterns on the Multiplication Table	As is		
4.8 Multiply with 8	As is		
4.9 Multiply with 9	As is		
4.9.1	Add	Use Lesson 3.4	Will take continued work through the year to address 3.OA.D.8

4.10 Multiplication	Modify	De-emphasize the focus on the table and use this lesson to provide more practice with students solving two-step problems in context.	Change will align lesson more closely to 3.OA.A.3 and 3.OA.D.8

👍 Chapter 4 Rules of Thumb	Rationale
Rely on the essential questions to guide instruction rather than the objectives.	The objectives name a variety of strategies and models that can distract from the understanding of multiplication and are not named in the 3.OA standards.
Encourage kids to use the facts they know for the distributive property rather than just the one that is shown (4.4 and 4.5).	To achieve 3.OA.C.7, students will need time and encouragement to develop luency. That progression will look different for different students.
Emphasize Rule of Thumb on Vocabulary for teachers to name properties as students are using them in their work throughout the chapter	MP.6 requires attention to precision.

Grade 3 / Chapter 5: Use Multiplication Facts

Lesson	Action	Details for the Action	Rationale
5.1 Describe Patterns	Modify (for earlier editions)	Replace the first Math Talk question with the one in later versions: "Look for a Pattern. Do you notice any other patterns in the Flashlights/Batteries table?"	3.OA.D.9 requires students to identify patterns. Change avoids making this a lesson about unit rates (7.RP.A.1)
5.2 Find Unknown Numbers	Delete	Move to the end of the chapter.	3.OA.A.4 is the bridge between 3.OA.A.1 and 3.OA.A.2. Moving to the end of chapter allows students to connect the work to the focus on division in the next chapter.
5.3 Use the Distributive Property 5.4 Multiplication Strategies with Multiples of 10	Modify	Condense the lessons so that students have an opportunity to connect strategies; be sure to use an array model to represent students' work solving the problems in 5.3.	3.NBT.A.3 requires that students use both properties of operations and place value strategies to set students up for 4.NBT.B.5.
5.5 Multiply 1-Digit Numbers by Multiplies of 10	As is		
5.5.1	Add	Use Lesson 5.2	3.OA.A.4 is the bridge between 3.OA.A.1 and 3.OA.A.2. Moving to the end of chapter allows students to connect the work to the focus on division in the next chapter

Chapter 5 Rule of Thumb	Rationale
Vertically aligned problems do not imply that students need to use the standard algorit to solve them.	These lessons focus on 3.NBT.A.3 which requires students to use place value understanding, which they are just beginning to relate to the operation of multiplication.

Grade 3 / Chapter 6: Understand Division

Lesson	Action	Details for the Action	Rationale
6.1 Model Division	As is		
6.2 Size of Equal Groups	As is		
6.3 Number of Equal Groups	As is		
6.4 Model with Bar Models	As is	Note: The title of the lesson is misleading; the focus of the lesson is introducing division notation	
6.5 Relate Subtraction and Division	Delete		3.OA.C.7 asks for fluency and this lesson works against it.
6.6 Model with Arrays	As is		
6.7 Relate Multiplication and Division	As is		
6.8 Write Related Facts	As is		
6.9 Division Rules for 1 and 0	As is		

👍 Chapter 6 Rules of Thumb	Rationale
Until division notation is introduced in 6.4, students should write missing factor equations to represent their work.	3.OA.B.6 requires students to connect multiplication and division.
Do not require students to use a specific model to solve division problems.	3.OA.A.3 does not require a specific representation.

Grade 3 / Chapter 7: Division Facts and Strategies

Lesson	Action	Details for the Action	Rationale
7.1 Divide by 2 7.5 Divide by 4	Modify	Condense to mirror structure of multiplication fact work in Chapter 3.	These lessons align to the work of 3.OA.C. The focus of lessons is on building fluency, rather than 3.OA.3 (as currently tagged), which requires application.
7.2 Divide by 10 7.3 Divide by 5	Modify	Condense to mirror structure of multiplication fact work in Chapter 3.	
7.4 Divide by 3 7.6 Divide by 6	Modify	Condense to mirror structure of multiplication fact work in Chapter 3.	
7.7 Divide by 7 7.8 Divide by 8	Modify	Condense to mirror structure of multiplication fact work in Chapter 3.	
7.9 Divide by 9	As is		
7.9.1	Add	Lesson with mixed practice with multiplication and division 1-step problems: LearnZillion, Unit 1, Lesson 7	3.OA.B.3 requires that students have the opportunity to interpret a variety of word problems. See Table 3: Multiplication and divisions situations (CC/OA Progression, p. 23).
7.9.2	Add	Lesson with mixed practice with 2-step problems, including all four operations and using variables: LearnZillion, Unit 15, Lesson 8 Extra practice with multi-step problems: CPALMS: Getting the hang of two-step word problems	Will take continued work through the year to address 3.OA.D.8

7.10 Two-Step Problems	Modify	Throughout the lesson, students should write an equation to represent the word problem. Teachers should bring up using parentheses to make the equation align to the word problem, when it matches work presented by students.	Will take continued work through the year to address 3.OA.D.8
7.11 Order of Operations	Delete		Not in Grade 3 standards; more aligned to 5.OA.A.1 For more information about Order of Operations and appropriate notation for Grade 3, see CC/OA Progression, p. 27.

👍 Chapter 7 Rule of Thumb	Rationale
Don't tell students to use a specific strategy or model to solve division problems. The goal is fluency, so students should be building on facts they know and may use different strategies to develop fluency.	3.OA.C.7 does not require specific strategies to develop fluency

Grade 3 / Chapter 8: Understand Fractions

| Lesson	Action	Details for the Action	Rationale
8.1 Equal Parts of a Whole	Delete		More aligned to 2.G.A.3 than Grade 3 expectations
8.1.1	Add	Lesson about naming fractions that builds on grade 2 work and extends to denominators of sixths, eighths: LearnZillion, Unit 4, Lesson 2 *[Note: Teachers may need to skip the number line representation, as this doesn't connect to 2nd grade work.]*	Need to make connection between Grade 2 work and aligning to 3.G.A.2.
8.2 Equal Shares	Delete		Aligns to 5.NF.B.3
8.3 Unit Fractions of a Whole	As is		
8.4 Fractions of a Whole	As is		
8.5 Fractions on a Number Line	As is		
8.5.1	Add	Lesson about placing fractions on a number line between 0 and 1: EngageNY,Module 5, Lesson 16	3.NF.A.2 includes working with fractions greater than 1, which are not fully addressed in other lessons.
8.5.2	Add	Lesson about placing fractions on a number line, including fractions greater than 1: EngageNY, Module 5, Lesson 17 Additional task to use: Illustrative Mathematics, Locating Fractions Greater than One on the Number Line	

8.6 Relate Fractions and Whole Numbers	Modify	Increase emphasis on number line by showing (or having kids use) a number line in addition to the area models.	Addresses 3.NF.A.2b
8.7 Fractions of a Group	Delete		Aligns to 5.NF.B.4
8.8 Find Part of a Group Using Unit Fractions	Delete		Aligns to 5.NF.B.4
8.9 Find the Whole Group Using Unit	Delete		Aligns to 5.NF.B.4

👍 Chapter 8 Rule of Thumb	Rationale
Rule of Thumb on Vocabulary -- Numerator and denominator need to be introduced and used consistently within the lessons	MP.6 requires attention to precision, including vocabulary.

Grade 3 / Chapter 9: Compare Fractions

Lesson	Action	Details for the Action	Rationale
9.1 Compare Fractions	Modify	Spend 2 days on this lesson. (Chapter At A Glance recommends 1-2 days.) Make concrete models and number lines available for students to use to solve the problem.	Students need more time to develop 3.NF.A.3d. MP.5 requires students to choose and use appropriate tools.
9.2 Compare Fractions with the Same Denominator	As is	.	
9.3 Compare Fractions with the Same Numerator	As is		
9.4 Compare Fractions	Delete		3.NF.A.3d only requires comparing fractions with the same numerator or denominator; this lesson includes all different fractions.
9.4.1	Add	Lesson about comparing fractions, including fractions greater than 1 using the number line: EngageNY, Module 5, Lesson 18	Focus on types of comparisons required in 3.NF.A.3d and using the number line to emphasize the cluster level understanding of 3.NF.A.
9.4.2	Add	Lesson about comparing fractions, including fractions greater than 1 using the number line: EngageNY, Module 5, Lesson 19	
9.4.3	Add	Practice with comparing fractions: Illustrative Mathematics, Comparing Fractions Game	
9.5 Compare and Order Fractions	Delete		3.NF.A.3d only asks for students to compare two fractions; this requires ordering.
9.6 Model Equivalent Fractions	As is		

9.7 Equivalent Fractions	Delete		3.NF.A.3b requires students to generate equivalent fraction; this lesson also does not allow students to explain why the fractions are equivalent.
9.7.1	Add	Lesson about generating equivalent fractions using models: EngageNY, Module 5, Lesson 22 Additional task to use: Illustrative Mathematics, Halves, Thirds and Sixths	3.NF.A.3b requires students to generate equivalent fractions.
9.7.2	Add	Practice generating and recognizing equivalent fractions: LearnZillion, Unit 10, Lesson 9 *[Note: Limit denominators to those required by 3.NF. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)]*	3.NF.A.3b requires students to generate equivalent fractions.

👍 **Chapter 9 Rules of Thumb**	**Rationale**
Eliminate any representations of fractions of a set.	Fractions of a set align to 5.NF.B.4.
Incorporate number line representations as much as possible.	Number lines are important to develop cluster level understanding of 3.NF.A.
Consistently reinforce the concept that fractions can only be compared when they refer to the same whole.	3.NF.A.3d requires that fractions being compared must refer to the same whole.

Grade 3 / Chapter 10: Time, Length, Liquid Volume, and Mass

Lesson	Action	Details for the Action	Rationale
10.1 Time to the Minute	As is		
10.2 A.M. and P.M.	Delete		Aligns to 2.MD.C.7
10.3 Measure Time Intervals	As is		
10.4 Use Time Intervals	As is		
10.5 Time Intervals	Delete		Aligns more to 4.MD.A.2. 3.MD.A.1 limits to problems that do not cross the hour marks.
10.6 Measure Length	As is		
10.7 Estimate and Measure Liquid Volume	As is		
10.8 Estimate and Measure Mass	As is		
10.9 Solve Problems About Liquid Volume and Mass	As is		
10.9.1	Add	Condense two lessons to give students more practice with one-step word problems involving measurement: ● Learn Zillion, Unit 6, Lesson 6 ● LearnZillion, Unit 14, Lesson 8 Teachers should mix up problems from the two lessons to give students practice with all four operations at once.	Students need more work on the second sentence of 3.MD.A.2 that requires solving word problems involving measurement.

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 3 / Chapter 11: Perimeter and Area

Lesson	Action	Details for the Action	Rationale
11.1 Model Perimeter	As is		
11.2 Find Perimeter	As is		
11.3 Find Unknown Side Lengths	As is		
11.4 Understand Area	As is		
11.5 Measure Area	As is		
11.6 Use Area Models	As is		
11.7 Area of Rectangles	Delete		Lesson includes multiplicative comparison (4.OA.A.1) and does not ensure that students are multiplying (3.MD.C.7b) because grids are provided.
11.7.1	Add	Lesson about directly connecting area to multiplication by moving away from using grids: Go Math, Grade 4, Lesson 13.2 Additional resource: EngageNY, Module 4 Lesson 7	
11.7,2	Add	Lesson about using tiling to relate the distributive property to area: LearnZillion, Unit 9, Lesson 4	3,MD.7c requires students to use tiling to relate area to the distributive property of multiplication.
11.8 Area of Combined Rectangles	Delete		Lesson doesn't get to the full depth of 3.MD.7c or 3.MD.7d.

11.8.1	Add	Lesson about identifying area as additive: Go Math, Grade 4, Lesson 13.3 Additional resources available: • Illustrative Mathematics, Three Hidden Rectangles • LearnZillion, Unit 9, Lesson 9	3.MD.C.7d requires recognizing area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problem
11.9 Same Perimeter, Different Areas	As is		
11.10 Same Area, Different Perimeters	As is		
11.10.1	Add	Practice with word problems involving area and perimeter: EngageNY, Module 7, Lesson 28	While the emphasis of 3.MD.C is on conceptual understanding of area, 3.MD.D.8 requires an application to real-world context that is not fully addressed in the unit.

Chapter 11 Rule of Thumb	Rationale
In area work, students should write the multiplication expression to find area.	3.MD.C.7 requires relating area to multiplication.

Grade 3 / Chapter 12: Two-Dimensional Shapes

Lesson	Action	Details for the Action	Rationale
12.1 Describe Plane Shapes	Delete		Vocabulary required aligns to expectations of 4.G.A
12.2 Describe Angles in Plane Shapes	Delete		Vocabulary required aligns to expectations of 4.G.A
12.3 Identify Polygons	As is		
12.4 Describe Sides of Polygons	As is		
12.5 Classify Quadrilaterals	As is		
12.6 Draw Quadrilaterals	As is		
12.7 Describe Triangles	Delete		More aligned to 4.G.A.2
12.8 Classify Plane Shapes	Delete		3.G.A.1 is fully addressed in the other lessons in this unit and this is Supporting Work.
12.9 Relate Shapes, Fractions, and Area	As is		

👆 Chapter 12 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	