# Guidance Document - *GO Math!* Grade 3

# 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](#)<br><br>Extra practice with addition computation to meet fluency expectations:<br>● [Add a three-digit and two-digit number so that the total is within 1000](#)<br>● [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:<br>● [Subtract 2-Digit from 3-Digit Number with Regrouping](#)<br>● [Subtract 3-digit from 3-digit number](#)<br>● [Subtract 3-Digit from 3-Digit Number with Regrouping](#)<br>● [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:<br>• 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 |
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| 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.<br><br>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<br>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 Multiples 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 algorithm 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<br>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<br>7.3 Divide by 5 | Modify | Condense to mirror structure of multiplication fact work in Chapter 3. | |
| 7.4 Divide by 3<br>7.6 Divide by 6 | Modify | Condense to mirror structure of multiplication fact work in Chapter 3. | |
| 7.7 Divide by 7<br>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<br><br>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<br><br>Additional task to use: Illustrative Mathematics, Locating Fractions Greater than One on the Number Line | |

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|---|---|---|---|
| 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.)<br><br>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.<br><br>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. |

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|---|---|---|---|
| 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<br><br>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<br>*[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:<br>● Learn Zillion, Unit 6, Lesson 6<br>● LearnZillion, Unit 14, Lesson 8<br><br>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<br><br>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](#)<br><br>Additional resources available:<br>● [Illustrative Mathematics, Three Hidden Rectangles](#)<br>● [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 |
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| 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 | |