# *GO Math!* Scope and Sequence

This document contains a high-level scope and sequence for the GO Math! program intended to give teachers an overview of where instructional time will be spent across the year through use of GO Math!. It provides a suggested sequence of instruction and assessments, including where NYCDOE Periodic Assessments can be used to gauge students' understanding of concepts and skills taught at benchmark moments throughout the year. Based on the Common Core Standards, Go Math! is divided into critical areas that offer a focused and coherent study of the key concepts and skills for each grade.

For each critical area, you will see the following:

- **Essential Ideas:** The key topics of the unit; chapters and lessons are built around achieving understanding and mastery of these topics.

- **Standards:** The standards listed show the main standards covered throughout the Critical Area. Instruction is focused on achieving a thorough knowledge of these standards.

- **Mathematical Practices:** While all practices are integrated into each Critical Area, the practices listed are ones that receive particular emphasis.

- **Essential Questions:** The essential question for each chapter is listed, showing the goal of each chapter.

- **Assessment Opportunities:** This listing highlights the assessments that ensure teachers can gauge student success on mastering the standards covered in the Critical Area.

| Grade K:  Suggested Sequence for the *GO Math!* program | Suggested Amount of Time (in days) |
|---|---|
| Critical Area 1: **Number and Operations** | 84 days |
| Critical Area 2: **Geometry and Positions** | 25 days |
| Critical Area 3: **Measurement and Data** | 15 days |

| | **Critical Area 1: Number and Operations** Chapters 1–8<br>84 Days (Instructional Days: 68; Assessment Days: 16) | **Critical Area 2: Geometry and Positions** Chapters 9–10<br>25 Days (Instructional Days: 21; Assessment Days: 4) |
|---|---|---|
| **Focus or Main CC Standards** | **Know number names and the count sequence.**<br>**K.CC.1** Count to 100 by ones and by tens.<br>**K.CC.2** Count forward beginning from a given number within the known sequence (instead of having to begin at 1).<br>**K.CC.3** Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).<br><br>**Count to tell the number of objects.**<br>**K.CC.4** Understand the relationship between numbers and quantities; connect counting to cardinality.<br>  **K.CC.4a** When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.<br>  **K.CC.4b** Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.<br>  **K.CC.4c** Understand that each successive number name refers to a quantity that is one larger.<br>**K.CC.5** Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.<br><br>**Compare numbers.**<br>**K.CC.6** Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.<br>**K.CC.7** Compare two numbers between 1 and 10 presented as written numerals.<br><br>**Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.**<br>**K.OA.1** Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.<br>**K.OA.2** Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.<br>**K.OA.3** Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).<br>**K.OA.4** For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.<br>**K.OA.5** Fluently add and subtract within 5.<br><br>**Work with numbers 11–19 to gain foundations for place value.**<br>**K.NBT.1** Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. | **Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).**<br>**K.G.1** Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.<br>**K.G.2** Correctly name shapes regardless of their orientations or overall size.<br>**K.G.3** Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").<br><br>**Analyze, compare, create, and compose shapes.**<br>**K.G.4** Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).<br>**K.G.5** Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.<br>**K.G.6** Compose simple shapes to form larger shapes. |
| **Highlighted Mathematical Practices** | **MP.5** Use appropriate tools strategically.<br>**MP.6** Attend to precision.<br>**MP.8** Look for and express regularity in repeated reasoning. | **MP.3** Construct viable arguments and critique the reasoning of others.<br>**MP.7** Look for and make use of structure. |
| **Essential Questions** | • How can you show, count, and write numbers 0 to 5? (Chapter 1)<br>• How can building and comparing sets help you compare numbers? (Chapter 2)<br>• How can you show, count, and write numbers 6 to 9? (Chapter 3)<br>• How can you show and compare numbers to 10? (Chapter 4)<br>• How can you show addition? (Chapter 5)<br>• How can you show subtraction? (Chapter 6)<br>• How can you show, count, and write numbers 11 to 19? (Chapter 7)<br>• How can you show, count, and write numbers to 10 and beyond? (Chapter 8) | • How can you identify, name, and describe two-dimensional shapes? (Chapter 9)<br>• How can identifying and describing shapes help you sort them? (Chapter 10) |
| **Assessment Opportunities** | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task |

## Critical Area 3: Measurement and Data Chapters 11–12
15 Days (Instructional Days: 11; Assessment Days: 4)

| | |
|---|---|
| **Focus or Main CC Standards** | **Describe and compare measurable attributes.**<br>**K.MD.1** Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.<br>**K.MD.2** Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.<br>**Classify objects and count the number of objects in each category.**<br>**K.MD.3** Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. |
| **Highlighted Mathematical Practices** | **MP.1** Make sense of problems and persevere in solving them.<br>**MP.2** Reason abstractly and quantitatively.<br>**MP.4** Model with mathematics. |
| **Essential Questions** | • How can comparing objects help you measure them? (Chapter 11)<br>• How does sorting help you display information? (Chapter 12) |
| **Assessment Opportunities** | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task |

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For each critical area, you will see the following:

- **Essential Ideas:** The key topics of the unit; chapters and lessons are built around achieving understanding and mastery of these topics.

- **Standards:** The standards listed show the main standards covered throughout the Critical Area. Instruction is focused on achieving a thorough knowledge of these standards.

- **Mathematical Practices:** While all practices are integrated into each Critical Area, the practices listed are ones that receive particular emphasis.

- **Essential Questions:** The essential question for each chapter is listed, showing the goal of each chapter.

- **Assessment Opportunities:** This listing highlights the assessments that ensure teachers can gauge student success on mastering the standards covered in the Critical Area.

| Grade 1: Suggested Sequence for the *GO Math!* program | Suggested Amount of Time (in days) |
|---|---|
| Critical Area 1: **Operations and Algebraic Thinking** | 55 days |
| Critical Area 2: **Number and Operations in Base Ten** | 30 days |
| Critical Area 3: **Measurement and Data** | 20 days |
| Critical Area 4: **Geometry** | 19 days |

| | Critical Area 1: Operations and Algebraic Thinking<br>Chapters 1–5<br>55 Days (Instructional Days: 45; Assessment Days: 10) | Critical Area 2: Number and Operations in Base Ten<br>Chapters 6–8<br>30 Days (Instructional Days: 24; Assessment Days: 6) |
|---|---|---|
| **Focus or Main CC Standards** | **Represent and solve problems involving addition and subtraction.**<br>**1.OA.1** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.<br>**1.OA.2** Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.<br><br>**Understand and apply properties of operations and the relationship between addition and subtraction.**<br>**1.OA.3** Apply properties of operations as strategies to add and subtract.<br>**1.OA.4** Understand subtraction as an unknown-addend problem<br>**Add and subtract within 20.**<br>**1.OA.5** Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).<br>**1.OA.6** Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).<br><br>**Work with addition and subtraction equations.**<br>**1.OA.8** Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers. | **Add and subtract within 20.**<br>**1.OA.6** Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).<br><br>**Extend the counting sequence.**<br>**1.NBT.1** Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.<br><br>**Understand place value.**<br>**1.NBT.2** Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:<br>**1.NBT.2a** 10 can be thought of as a bundle of ten ones — called a "ten."<br>**1.NBT.2b** The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.<br>**1.NBT.2c** The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).<br>**1.NBT.3** Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.<br><br>**Use place value understanding and properties of operations to add and subtract.**<br>**1.NBT.4** Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.<br>**1.NBT.5** Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.<br>**1.NBT.6** Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. |
| **Highlighted Mathematical Practices** | **MP.2** Reason abstractly and quantitatively.<br>**MP.4** Model with mathematics.<br>**MP.8** Look for and express regularity in repeated reasoning. | **MP.1** Make sense of problems and persevere in solving them.<br>**MP.3** Construct viable arguments and critique the reasoning of others.<br>**MP.6** Attend to precision. |
| **Essential Questions** | • How can you model adding within 10? (Chapter 1)<br>• How can you subtract numbers from 10 or less? (Chapter 2)<br>• How do you solve addition problems? (Chapter 3)<br>• How do you solve subtraction problems? (Chapter 4)<br>• How can relating addition and subtraction help you to learn and understand facts within 20? (Chapter 5) | • How do you use place value to model, read, and write numbers to 120? (Chapter 6)<br>• How do you use place value to compare numbers? (Chapter 7)<br>• How can you add and subtract two-digit numbers? (Chapter 8) |
| **Assessment Opportunities** | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task |

| | **Critical Area 3: Measurement and Data** Chapters 9–10<br>20 Days (Instructional Days: 16; Assessment Days: 4) | **Critical Area 4: Geometry** Chapters 11–12<br>19 Days (Instructional Days: 15; Assessment Days: 4) |
|---|---|---|
| **Focus or Main CC Standards** | **Measure lengths indirectly and by iterating length units.**<br>**1.MD.1** Order three objects by length; compare the lengths of two objects indirectly by using a third object.<br>**1.MD.2** Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.<br>**Tell and write time.**<br>**1.MD.3** Tell and write time in hours and half-hours using analog and digital clocks.<br>**Represent and interpret data.**<br>**1.MD.4** Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. | **Reason with shapes and their attributes.**<br>**1.G.1** Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.<br>**1.G.2** Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.<br>**1.G.3** Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. |
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| **Essential Questions** | • How can you measure length and tell time? (Chapter 9)<br>• How can graphs and charts help you organize, represent, and interpret data? (Chapter 10) | • How do you identify and describe three-dimensional shapes? (Chapter 11)<br>• How do you sort and describe two-dimensional shapes? (Chapter 12) |
| **Assessment Opportunities** | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task |

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| Grade 2: Suggested Sequence for the *GO Math!* program | Suggested Amount of Time (in days) |
|---|---|
| Critical Area 1: **Number Sense and Place Value** | 25 days |
| Critical Area 2: **Addition and Subtraction** | 52 days |
| Critical Area 3: **Measurement and Data** | 41 days |
| Critical Area 4: **Geometry and Fractions** | 12 days |

| | Critical Area 1: Number Sense and Place Value | Critical Area 2: Addition and Subtraction |
|---|---|---|
| | Chapters 1–2 | Chapters 3–6 |
| | 25 Days (Instructional Days: 21; Assessment Days: 4) | 52 Days (Instructional Days: 44; Assessment Days: 8) |
| **Focus or Main CC Standards** | **Work with equal groups of objects to gain foundations for multiplication.**<br>**2.OA.3** Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.<br>**Understand place value.**<br>**2.NBT.1** Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:<br>2.NBT.1a 100 can be thought of as a bundle of ten tens — called a "hundred."<br>2.NBT.1b The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).<br>**2.NBT.2** Count within 1000; skip-count by 5s, 10s, and 100s.<br>**2.NBT.3** Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.<br>**2.NBT.4** Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.<br>**Use place value understanding and properties of operations to add and subtract.**<br>**2.NBT.8** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900. | **Represent and solve problems involving addition and subtraction.**<br>**2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.<br>**Add and subtract within 20.**<br>**2.OA.2** Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.<br>Work with equal groups of objects to gain foundations for multiplication.<br>**2.OA.4** Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.<br>**Use place value understanding and properties of operations to add and subtract.**<br>**2.NBT.5** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.<br>**2.NBT.6** Add up to four two-digit numbers using strategies based on place value and properties of operations.<br>**2.NBT.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. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.<br>**2.NBT.9** Explain why addition and subtraction strategies work, using place value and the properties of operations. |
| **Highlighted Mathematical Practices** | **MP.6** Attend to precision.<br>**MP.7** Look for and make use of structure.<br>**MP.8** Look for and express regularity in repeated reasoning. | **MP.1** Make sense of problems and persevere in solving them.<br>**MP.2** Reason abstractly and quantitatively.<br>**MP.4** Model with mathematics. |
| **Essential Questions** | • How do you use place value to find the values of numbers and describe numbers in different ways? Chapter 1)<br>• How can you use place value to model, write, and compare 3-digit numbers? (Chapter 2) | • How can you use patterns and strategies to find sums and differences for basic facts? (Chapter 3)<br>• How do you use place value to add 2-digit numbers, and what are some different ways to add 2-digit numbers? (Chapter 4)<br>• How do you use place value to subtract 2-digit numbers with and without regrouping? (Chapter 5)<br>• What are some strategies for adding and subtracting 3-digit numbers? (Chapter 6) |
| **Assessment Opportunities** | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task |

| | **Critical Area 3: Measurement and Data** Chapters 7–10<br>41 Days (Instructional Days: 33; Assessment Days: 8) | **Critical Area 4: Geometry and Fractions** Chapters 11<br>12 Days (Instructional Days: 10; Assessment Days: 2) |
|---|---|---|
| **Focus or Main CC Standards** | **Measure and estimate lengths in standard units.**<br>**2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.<br>**2.MD.2** Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.<br>**2.MD.3** Estimate lengths using units of inches, feet, centimeters, and meters.<br>**2.MD.4** Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.<br><br>**Relate addition and subtraction to length.**<br>**2.MD.5** Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.<br>**2.MD.6** Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.<br><br>**Work with time and money.**<br>**2.MD.7** Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.<br>**2.MD.8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.<br><br>**Represent and interpret data.**<br>**2.MD.9** Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.<br>**2.MD.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph. | **Reason with shapes and their attributes.**<br>**2.G.1** Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.<br>**2.G.2** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.<br>**2.G.3** Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. |
| **Highlighted Mathematical Practices** | **MP.3** Construct viable arguments and critique the reasoning of others.<br>**MP.6** Attend to precision.<br>**MP.8** Look for and express regularity in repeated reasoning. | **MP.1** Make sense of problems and persevere in solving them.<br>**MP.3** Construct viable arguments and critique the reasoning of others.<br>**MP.6** Attend to precision. |
| **Essential Questions** | • How do you use the values of coins and bills to find the total value of a group of money, and how do you read times shown on analog and digital clocks? (Chapter 7)<br>• What are some of the methods and tools that can be used to estimate and measure length? (Chapter 8)<br>• What are some of the methods and tools that can be used to estimate and measure length in metric units? (Chapter 9)<br>• How do tally charts, picture graphs, and bar graphs help you solve problems? (Chapter 10) | • What are some two-dimensional shapes and three-dimensional shapes, and how can you show equal parts of shapes? (Chapter 11) |
| **Assessment Opportunities** | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task |

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| Grade 3: Suggested Sequence for the *GO Math!* program | Suggested Amount of Time (in days) |
|---|---|
| Critical Area 1: **Whole Number Operations** | 75 days |
| *NYCDOE Fall Benchmark Assessment* | |
| Critical Area 2: **Understanding Fractions** | 20 days |
| Critical Area 3: **Measurement** | 23 days |
| *NYCDOE Spring Benchmark Assessment* | |
| Critical Area 4: **Geometry** | 11 days |
| *State Examination*[1] | |

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[1] The *GO Math!* program is paced to ensure that all pre-test and post-test standards are completely and fully covered prior to testing.  As the transition to the PARCC assessments progresses, schools may choose to make decisions around the pacing of units that address post-test concepts prior to the state examination in consideration of the state's testing program guidance (see http://www.p12.nysed.gov/assessment/math/math-ei.html).

| | **Critical Area 1: Whole Number Operations** Chapters 1–7<br>75 Days (Instructional Days: 61; Assessment Days: 14) | **Critical Area 2: Understanding Fractions**<br>Chapters 8–9<br>20 Days (Instructional Days: 16; Assessment Days: 4) |
|---|---|---|
| **Focus or Main CC Standards** | **Represent and solve problems involving multiplication and division.**<br>**3.OA.1** Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.<br>**3.OA.2** Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.<br>**3.OA.3** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.<br>**3.OA.4** Determine the unknown whole number in a multiplication or division equation relating three whole numbers.<br>**Understand properties of multiplication and the relationship between multiplication and division.**<br>**3.OA.5** Apply properties of operations as strategies to multiply and divide.<br>**3.OA.6** Understand division as an unknown-factor problem.<br>**Multiply and divide within 100.**<br>**3.OA.7** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.<br>**Solve problems involving the four operations, and identify and explain patterns in arithmetic.**<br>**3.OA.8** Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.<br>**3.OA.9** Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.<br>**Represent and interpret data.**<br>**3.MD.3** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.<br>**3.MD.4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.<br>**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**<br>**3.MD.7** Relate area to the operations of multiplication and addition.<br>**3.MD.7c** Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.<br>Also 3.NBT.1, 3.NBT.2, 3.NBT.3 | **Develop understanding of fractions as numbers.**<br>**3.NF.1** Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.<br>**3.NF.2** Understand a fraction as a number on the number line; represent fractions on a number line diagram.<br>**3.NF.2a** Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.<br>**3.NF.2b** Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.<br>**3.NF.3** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.<br>**3.NF.3a** Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.<br>**3.NF.3b** Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model.<br>**3.NF.3c** Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.<br>**3.NF.3d** Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.<br>**Reason with shapes and their attributes.**<br>**3.G.2** Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. |
| **Highlighted Mathematical Practices** | **MP.2** Reason abstractly and quantitatively.<br>**MP.4** Model with mathematics.<br>**MP.7** Look for and make use of structure. | **MP.1** Make sense of problems and persevere in solving them.<br>**MP.3** Construct viable arguments and critique the reasoning of others.<br>**MP.4** Model with mathematics. |
| **Essential Questions** | • How can you add and subtract whole numbers and decide if an answer is reasonable? (Chapter 1)<br>• How can you represent and interpret data? (Chapter 2)<br>• How can you use multiplication to find how many in all? (Chapter 3)<br>• What strategies can you use to multiply? (Chapter 4)<br>• How can you use multiplication facts, place value, and properties to solve multiplication problems? (Chapter 5)<br>• How can you use division to find how many in each group or how many equal groups? (Chapter 6)<br>• What strategies can you use to divide? (Chapter 7) | • How can you use fractions to describe how much or how many? (Chapter 8)<br>• How can you compare fractions? (Chapter 9) |
| **Assessment Opportunities** | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task<br><br>***NYCDOE Fall Benchmark Assessment*** | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task |

## Critical Area 3: Measurement Chapters 10–11
23 Days (Instructional Days: 19; Assessment Days: 4)

## Critical Area 4: Geometry Chapters 12
11 Days (Instructional Days: 9; Assessment Days: 2)

**Focus or Main CC Standards**

### Critical Area 3

**Understand properties of multiplication and the relationship between multiplication and division.**

**3.OA.5** Apply properties of operations as strategies to multiply and divide.

**Multiply and divide within 100.**

**3.OA.7** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

**Solve problems involving the four operations, and identify and explain patterns in arithmetic.**

**3.OA.8** Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

**3.OA.9** Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

**Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.**

**3.MD.1** Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

**3.MD.2** Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).6 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

**Represent and interpret data.**

**3.MD.4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

**3.MD.5** Recognize area as an attribute of plane figures and understand concepts of area measurement.
**3.MD.5a** A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
**3.MD.5b** A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

**3.MD.6** Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

**3.MD.7** Relate area to the operations of multiplication and addition.
**3.MD.7a** Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
**3.MD.7b** Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
**3.MD.7c** Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.
**3.MD.7d** Recognize 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 problems.

Also 3.NBT.2, 3.MD.8

### Critical Area 4

**Develop understanding of fractions as numbers.**

**3.NF.1** Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.

**3.NF.3** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
**3.NF.3d** Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

**3.MD.5** Recognize area as an attribute of plane figures and understand concepts of area measurement.

**Reason with shapes and their attributes.**

**3.G.1** Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

**3.G.2** Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

**Highlighted Mathematical Practices**

| | |
|---|---|
| **MP.1** | Make sense of problems and persevere in solving them. |
| **MP.5** | Use appropriate tools strategically. |
| **MP.8** | Look for and express regularity in repeated reasoning. |

| | |
|---|---|
| **MP.6** | Attend to precision. |
| **MP.7** | Look for and make use of structure. |
| **MP.8** | Look for and express regularity in repeated reasoning. |

**Essential Questions**

- How can you tell time and use measurement to describe the size of something? (Chapter 10)
- How can you solve problems involving perimeter and area? (Chapter 11)

- What are some ways to describe and classify two-dimensional shapes? (Chapter 12)

**Assessment Opportunities**

Show What You Know
Mid-Chapter Checkpoint
Chapter Review/Test
Chapter Test
Chapter Performance Task
Critical Area Performance Task

**NYCDOE Spring Benchmark Assessment**

Show What You Know
Mid-Chapter Checkpoint
Chapter Review/Test
Chapter Test
Chapter Performance Task
Critical Area Performance Task

**State Examination**

# GO Math! Scope and Sequence

This document contains a high-level scope and sequence for the GO Math! program intended to give teachers an overview of where instructional time will be spent across the year through use of GO Math!. It provides a suggested sequence of instruction and assessments, including where NYCDOE Periodic Assessments can be used to gauge students' understanding of concepts and skills taught at benchmark moments throughout the year. Based on the Common Core Standards, Go Math! is divided into critical areas that offer a focused and coherent study of the key concepts and skills for each grade.

For each critical area, you will see the following:

- **Essential Ideas:** The key topics of the unit; chapters and lessons are built around achieving understanding and mastery of these topics.

- **Standards:** The standards listed show the main standards covered throughout the Critical Area. Instruction is focused on achieving a thorough knowledge of these standards.

- **Mathematical Practices:** While all practices are integrated into each Critical Area, the practices listed are ones that receive particular emphasis.

- **Essential Questions:** The essential question for each chapter is listed, showing the goal of each chapter.

- **Assessment Opportunities:** This listing highlights the assessments that ensure teachers can gauge student success on mastering the standards covered in the Critical Area.

| Grade 4: Suggested Sequence for the *GO Math!* program | Suggested Amount of Time (in days) |
|---|---|
| Critical Area 1: **Place Value and Operations with Whole Numbers** | 53 days |
| *NYCDOE Fall Benchmark Assessment* | |
| Critical Area 2: **Fractions and Decimals** | 38 days |
| Critical Area 3: **Geometry, Measurement, and Data** | 36 days |
| *NYCDOE Spring Benchmark Assessment* | |
| *State Examination[1]* | |

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[1] The *GO Math!* program is paced to ensure that all pre-test and post-test standards are completely and fully covered prior to testing. As the transition to the PARCC assessments progresses, schools may choose to make decisions around the pacing of units that address post-test concepts prior to the state examination in consideration of the state's testing program guidance (see http://www.p12.nysed.gov/assessment/math/math-ei.html).

| Critical Area 1: Place Value and Operations with Whole Numbers Chapters 1–5<br>53 Days (Instructional Days: 43; Assessment Days: 10) | Critical Area 2: Fractions and Decimals Chapters 6–9<br>38 Days (Instructional Days: 30; Assessment Days: 8) |
|---|---|

| **Focus or Main CC Standards** | **Use the four operations with whole numbers to solve problems.**<br>**4.OA.3** Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.<br>**Generalize place value understanding for multi-digit whole numbers.**<br>**4.NBT.1** Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.<br>**4.NBT.2** Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.<br>**4.NBT.3** Use place value understanding to round multi-digit whole numbers to any place.<br>**Use place value understanding and properties of operations to perform multi-digit arithmetic.**<br>**4.NBT.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.<br>**4.NBT.6** Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.<br><br>Also 4.OA.1, 4.OA.2, 4.OA.4, 4.OA.5, 4.N BT.4 | **Extend understanding of fraction equivalence and ordering.**<br>**4.NF.1** Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.<br>**4.NF.2** Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as ½. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.<br>**Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.**<br>**4.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.<br>**4.NF.4.a.** Understand a fraction a/b as a multiple of 1/b.<br>**4.NF.4.b.** Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number.<br>**4.NF.4.c.** Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.<br><br>Also 4.NF.3, 4.NF.5, 4.NF.6, 4.NF.7, 4.MD.2 |
| **Highlighted Mathematical Practices** | **MP.4** Model with mathematics.<br>**MP.5** Use appropriate tools strategically.<br>**MP.7** Look for and make use of structure. | **MP.1** Make sense of problems and persevere in solving them.<br>**MP.2** Reason abstractly and quantitatively.<br>**MP.5** Use appropriate tools strategically. |
| **Essential Questions** | • How can you use place value to compare, add, subtract, and estimate with whole numbers? (Chapter 1)<br>• What strategies can you use to multiply by 1-digit numbers? (Chapter 2)<br>• What strategies can you use to multiply by 2-digit numbers? (Chapter 3)<br>• How can you divide by 1-digit numbers? (Chapter 4)<br>• How can you find factors and multiples, and how can you generate and describe number patterns? (Chapter 5) | • What strategies can you use to compare fractions and write equivalent fractions? (Chapter 6)<br>• How do you add or subtract fractions that have the same denominator? (Chapter 7)<br>• How do you multiply fractions by whole numbers? (Chapter 8)<br>• How can you record decimal notation for fractions and compare decimal fractions? (Chapter 9) |
| **Assessment Opportunities** | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task | Show What You Know<br>Mid-Chapter Checkpoint<br>Chapter Review/Test<br>Chapter Test<br>Chapter Performance Task<br>Critical Area Performance Task |

*NYCDOE Fall Benchmark Assessment*

## Critical Area 3: Geometry, Measurement, and Data
Chapters 10–13
36 Days (Instructional Days: 28; Assessment Days: 8)

| | |
|---|---|
| **Focus or Main CC Standards** | **Draw and identify lines and angles, and classify shapes by properties of their lines and angles.** |
| | **4.G.1** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. |
| | **4.G.2** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. |
| | **4.G.3** Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. |
| | Also 4.OA.5, 4.MD.1, 4.MD.2, 4.MD.3, 4.MD.4, 4.MD.5, 4.MD.6, 4.MD.7 |
| **Highlighted Mathematical Practices** | **MP.1** Make sense of problems and persevere in solving them. |
| | **MP.2** Reason abstractly and quantitatively. |
| | **MP.6** Attend to precision. |
| **Essential Questions** | • How can you draw and identify lines and angles, and how can you classify shapes? (Chapter 10) |
| | • How can you measure angles and solve problems involving angle measures? (Chapter 11) |
| | • How can you use relative sizes of measurements to solve problems and to generate measurement tables that show a relationship? (Chapter 12) |
| | • How can you use formulas for perimeter and area to solve problems? (Chapter 13) |
| **Assessment Opportunities** | Show What You Know |
| | Mid-Chapter Checkpoint |
| | Chapter Review/Test |
| | Chapter Test |
| | Chapter Performance Task |
| | Critical Area Performance Task |

*NYCDOE Spring Benchmark Assessment*

*State Examination*

# GO Math! Scope and Sequence

This document contains a high-level scope and sequence for the GO Math! program intended to give teachers an overview of where instructional time will be spent across the year through use of GO Math!. It provides a suggested sequence of instruction and assessments, including where NYCDOE Periodic Assessments can be used to gauge students' understanding of concepts and skills taught at benchmark moments throughout the year. Based on the Common Core Standards, Go Math! is divided into critical areas that offer a focused and coherent study of the key concepts and skills for each grade.

For each critical area, you will see the following:

- **Essential Ideas:** The key topics of the unit; chapters and lessons are built around achieving understanding and mastery of these topics.

- **Standards:** The standards listed show the main standards covered throughout the Critical Area. Instruction is focused on achieving a thorough knowledge of these standards.

- **Mathematical Practices:** While all practices are integrated into each Critical Area, the practices listed are ones that receive particular emphasis.

- **Essential Questions:** The essential question for each chapter is listed, showing the goal of each chapter.

- **Assessment Opportunities:** This listing highlights the assessments that ensure teachers can gauge student success on mastering the standards covered in the Critical Area.

| Grade 5: Suggested Sequence for the *GO Math!* program | Suggested Amount of Time (in days) |
|---|---|
| Critical Area 1: **Fluency with Whole Numbers and Decimals** | 59 days |
| *NYCDOE Fall Benchmark Assessment* | |
| Critical Area 2: **Operations with Fractions** | 31 days |
| Critical Area 3: **Geometry and Measurement** | 32 days |
| *NYCDOE Spring Benchmark Assessment* | |
| *State Examination[1]* | |

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[1] The *GO Math!* program is paced to ensure that all pre-test and post-test standards are completely and fully covered prior to testing.  As the transition to the PARCC assessments progresses, schools may choose to make decisions around the pacing of units that address post-test concepts prior to the state examination in consideration of the state's testing program guidance (see http://www.p12.nysed.gov/assessment/math/math-ei.html).

| | **Critical Area 1: Fluency with Whole Numbers and Decimals** Chapters 1–5 <br> 59 Days (Instructional Days: 49; Assessment Days: 10) | **Critical Area 2: Operations with Fractions** Chapters 6–8 <br> 31 Days (Instructional Days: 25; Assessment Days: 6) |
|---|---|---|
| **Focus or Main CC Standards** | **Write and interpret numerical expressions.** <br> **5.OA.1** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. <br> **5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. <br><br> **Understand the place value system.** <br> **5.NBT.1** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. <br> **5.NBT.2** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. <br> **5.NBT.3** Read, write, and compare decimals to thousandths. <br>     **5.NBT.3a** Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$. <br>     **5.NBT.3b** Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. <br> **5.NBT.4** Use place value understanding to round decimals to any place. <br><br> **Perform operations with multi-digit whole numbers and with decimals to hundredths.** <br> **5.NBT.5** Fluently multiply multi-digit whole numbers using the standard algorithm. <br> **5.NBT.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. <br> **5.NBT.7** Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. <br><br> **Apply and extend previous understandings of multiplication and division to multiply and divide fractions.** <br> **5.NF.3** Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. | **Write and interpret numerical expressions.** <br> **5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. <br><br> **Use equivalent fractions as a strategy to add and subtract fractions.** <br> **5.NF.1** Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. <br> **5.NF.2** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. <br><br> **Apply and extend previous understandings of multiplication and division to multiply and divide fractions.** <br> **5.NF.3** Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. <br> **5.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. <br>     **5.NF.4a** Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. <br>     **5.NF.4b** Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. <br> **5.NF.5** Interpret multiplication as scaling (resizing), by: <br>     **5.NF.5a** Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. <br>     **5.NF.5b** Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n×a)/(n×b) to the effect of multiplying a/b by 1. <br> **5.NF.6** Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. <br> **5.NF.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. <br>     **5.NF.7a** Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. <br>     **5.NF.7b** Interpret division of a whole number by a unit fraction, and compute such quotients. <br>     **5.NF.7c** Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. |
| **Highlighted Mathematical Practices** | **MP.1** Make sense of problems and persevere in solving them. <br> **MP.6** Attend to precision. <br> **MP.8** Look for and express regularity in repeated reasoning. | **MP.3** Construct viable arguments and critique the reasoning of others. <br> **MP.6** Attend to precision. <br> **MP.7** Look for and make use of structure. |
| **Essential Questions** | • How can you use place value, multiplication, and expression to represent and solve problems? (Chapter 1) <br> • How can you divide whole numbers? (Chapter 2) <br> • How can you add and subtract decimals? (Chapter 3) <br> • How can you solve decimal multiplication problems? (Chapter 4) <br> • How can you solve decimal division problems? (Chapter 5) | • How can you add and subtract fractions with unlike denominators? (Chapter 6) <br> • How do you multiply fractions? (Chapter 7) <br> • What strategies can you use to solve division problems involving fractions? (Chapter 8) |
| **Assessment Opportunities** | Show What You Know <br> Mid-Chapter Checkpoint <br> Chapter Review/Test <br> Chapter Test <br> Chapter Performance Task <br> Critical Area Performance Task <br><br> ***NYCDOE Fall Benchmark Assessment*** | Show What You Know <br> Mid-Chapter Checkpoint <br> Chapter Review/Test <br> Chapter Test <br> Chapter Performance Task <br> Critical Area Performance Task |

## Critical Area 3: Geometry and Measurement Chapters 9–11
### 32 Days (Instructional Days: 26; Assessment Days: 6)

**Focus or Main CC Standards**

**Write and interpret numerical expressions.**

**5.OA.1** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

**Analyze patterns and relationships.**

**5.OA.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

**Understand the place value system.**

**5.NBT.1** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

**Perform operations with multi-digit whole numbers and with decimals to hundredths.**

**5.NBT.5** Fluently multiply multi-digit whole numbers using the standard algorithm.

**5.NBT.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**

**5.NF.3** Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

**5.NF.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

**5.NF.7a** Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.

**Convert like measurement units within a given measurement system.**

**5.MD.1** Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

**Represent and interpret data.**

**5.MD.2** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.

**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**

**5.MD.3** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

**5.MD.3a** A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.

**5.MD.3b** A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

**5.MD.4** Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

**5.MD.5** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

**5.MD.5a** Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.

**5.MD.5b** Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.

**5.MD.5c** Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

**Graph points on the coordinate plane to solve real-world and mathematical problems.**

**5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

Also 5.G.2, 5.G.3, 5.G.4

**Highlighted Mathematical Practices**

**MP.5** Use appropriate tools strategically.
**MP.6** Attend to precision.
**MP.7** Look for and make use of structure.

**Essential Questions**

- How can you use line plots, coordinate grids, and patterns to help you graph and interpret data? (Chapter 9)
- What strategies can you use to compare and convert measurements? (Chapter 10)
- How do unit cubes help you build solid figures and understand the volume of a rectangular prism? (Chapter 11)

**Assessment Opportunities**

Show What You Know
Mid-Chapter Checkpoint
Chapter Review/Test
Chapter Test
Chapter Performance Task
Critical Area Performance Task

***NYCDOE Spring Benchmark Assessment***

***State Examination***