

# New York City Department of Education

## Scope and Sequence Sample— Grade 3

### 2012-13 School Year

#### Overview

This document was created after closely examining the Common Core Learning Standards (CCLS) and the previous New York State Standards and updated after examining NYS' recently released [scope and sequence supports](#) and testing program [guidance](#). It provides a high-level CCLS-aligned scope and sequence for Mathematics that also takes into account the differences in and transition from the New York State Standards. The scope and sequence is aligned to the Common Core and demonstrates a focus on the major work of the grade<sup>1</sup>, which the [State has indicated](#) will be the focus of next year's 3-8 State exams. This scope and sequence represents one way that a school may choose to organize and teach the full range of the standards and incorporate the State's [pre and post-test standards](#) guidance. This document contains the following components:

- **Year-long Overview:** A one-page view of the year that shows the:
  - **Unit Summary & Benchmark Assessment Moments:** The number of suggested units across the year and the amount of instructional time spent on each unit including suggestions for where schools may choose to administer the new Common Core-aligned benchmark assessments available through the Periodic Assessment program.
  - **Concepts that Should be Omitted:** Concepts that are no longer taught at this grade-level according to the CCLS.
  - **Bridge Guidance:** Concepts that would have been taught in earlier grades, according to the Common Core, but were not part of the New York State Standards. They should be considered and woven into units during transition years since the concepts were not previously addressed/addressed fully in the New York State Standards. We ask that you consider the needs of your students when deciding if it is necessary to teach these concepts. Please note: Bridge concepts are intended for instructional consideration when crafting a coherent sequence of instruction during the transitional years only and are not a part of SED's draft Test Program Guidance.
- **High-level Unit Overviews:** Overviews of each unit that include the:
  - **Unit Description:** A narrative description of the concepts the unit is intended to cover and the amount of instructional time suggested.
  - **Standards:** The group of related standards that should be taught within the unit.

#### How to Use:

To use this document, teacher teams could:

- Review the year-long and unit overviews to assess whether the scope and sequence makes sense for their school.
- Review the resources available by standard in each high-level unit overview.
- Use the high-level unit overviews and resources available to teach a sequence of instruction that fully addresses the standards represented.

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<sup>1</sup> For a listing of content emphases by cluster, refer to <http://engageny.org/resource/math-content-emphases>. For additional guidance—including key advances by grade, opportunities for in-depth focus, connections between content and practice standards, etc.—refer to [http://www.parcconline.org/sites/parcc/files/PARCCMCFMathematics\\_August%202012rev2\\_FINAL.pdf](http://www.parcconline.org/sites/parcc/files/PARCCMCFMathematics_August%202012rev2_FINAL.pdf). With questions or feedback on this document, please email [commoncorefellows@schools.nyc.gov](mailto:commoncorefellows@schools.nyc.gov).

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### Grade 3 Year-Long Overview:

This table shows an overview of all units that should be taught across the year and the recommended instructional time for each unit<sup>1</sup>.

| Grade 3: Suggested Distribution of Units in Instructional Days                      | Time | # of weeks |
|---|------|------------|
| Unit 1: Multiplication and Division with Factors of 2, 3, 4, 5 and 10               | 13%  | 5 weeks    |
| Unit 2: Problem Solving with Mass, Time and Capacity                                | 13%  | 5 weeks    |
| <i>Assessment Moment: Acuity Benchmark 1</i>  |      |            |
| Unit 3: Multiplication and Division with Factors of 6, 7, 8 and 9                   | 13%  | 5 weeks    |
| Unit 4: Multiplication and Area   | 11%  | 4 weeks    |
| <i>Assessment Moment: Acuity Benchmark 2</i>  |      |            |
| Unit 5: Fractions as Numbers on the Number Line                                     | 22%  | 7 weeks    |
| <b>State Test</b>   |      |            |
| Unit 6: Collecting and Displaying Data ( <i>Post-Test Unit</i> )                    | 5%   | 2 weeks    |
| Unit 7: Quadrilaterals and More Challenging Word Problems ( <i>Post-Test Unit</i> ) | 23%  | 8 weeks    |

#### **Concepts that should be Omitted:**

- Describe and extend geometric patterns.
- Measure and compare customary capacity and mass
- Display data in a frequency table.

#### **Bridge Concepts**

- Solving one and two step addition and subtraction problems within 100.
- Read, write, and subtract within 1000.

<sup>1</sup> Unit overviews and suggested instructional time are based on *Common Core Curriculum Maps in Mathematics A Story of Units Pre-K- 5* developed by Common Core, Inc.  
Version 9.17.12

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### Unit 1: Multiplication and Division with Factors of 2, 3, 4, 5 and 10 - (5 Weeks)

**DESCRIPTION:** Students will build upon multiplicative thinking with units started in grade 2. Students will concentrate on the meaning of multiplication and division and begin fluency for learning products involving factors of 2, 3, 4, 5, and 10. The restricted set of facts makes learning manageable for beginners while providing enough examples to start word and measurement problems involving weight, capacity, and time. The Mathematical Practices should be evident throughout instruction and connected to the content addressed in this unit. Students should engage in mathematical tasks that provide an opportunity to connect content and practices.

#### Standards

The standards listed below are **not** intentionally sequenced and should **not** simply be taught consecutively. Strong units weave these standards together in a thoughtful and coherent way. Schools and teacher teams can use this document to compare their current curriculum to and choose high leverage moments to enhance instruction.

#### Represent and solve problems involving multiplication and division.

**3.OA.1:** Interpret products of whole numbers, e.g., interpret  $5 \times 7$  as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as  $5 \times 7$ .

**3.OA.2:** Interpret whole-number quotients of whole numbers, e.g., interpret  $56 \div 8$  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. For example, describe a context in which a number of shares or a number of groups can be expressed as  $56 \div 8$ .

**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.

**3.OA.4:** Determine the unknown number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations  $8 \times ? = 48$ ,  $5 = \underline{\quad} \div 3$ ,  $6 \times 6 = ?$

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

**3.OA.5:** Apply properties of operations as strategies to multiply and divide. Examples: If  $6 \times 4 = 24$  is known, then  $4 \times 6 = 24$  is also known. (Commutative property of multiplication.)  $3 \times 5 \times 2$  can be found by  $3 \times 5 = 15$ , then  $15 \times 2 = 30$ , or by  $5 \times 2 = 10$ , then  $3 \times 10 = 30$ . (Associative property of multiplication.) Knowing that  $8 \times 5 = 40$  and  $8 \times 2 = 16$ , one can find  $8 \times 7$  as  $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$ . (Distributive property.)

**3.OA.6:** Understand division as an unknown-factor problem. For example, find  $32 \div 8$  by finding the number that makes 32 when multiplied by 8. Multiply and divide within 100.<sup>2</sup>

#### 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.

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**3.OA.9:** Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even and explain why 4 times a number can be decomposed into two equal addends.

**Bridge Guidance:** *Concepts that would have been taught in earlier grades, according to the Common Core, but were not part of the New York State Standards. They should be considered and woven into units during transition years since the concepts were not previously addressed/addressed fully in the New York State Standards. We ask that you consider the needs of your students when deciding if it is necessary to teach these concepts. Please note: Bridge concepts are intended for instructional consideration when crafting a coherent sequence of instruction during the transitional years only and are not a part of SED's draft Test Program Guidance.*

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**2.OA.1** Use addition & subtraction strategies within 100 to solve one & two<sup>3</sup>-step word problems involving situations of adding to, taking from, putting together, taking apart, & comparing, with unknowns in all positions,<sup>4</sup> e.g., by using drawings & equations with a symbol for the unknown number to represent the problem.

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### Unit 2: Problem Solving with Mass, Time and Capacity- (5 Weeks)

**DESCRIPTION:** This unit plays a role of providing students with “internalization time” before students start into the remaining facts in unit 3. Students will work with place value, comparison and rounding. The goal is to develop students’ number sense well enough to build proportional bar diagrams used in solving word problems throughout third grade and beyond. The Mathematical Practices should be evident throughout instruction and connected to the content addressed in this unit. Students should engage in mathematical tasks that provide an opportunity to connect content and practices.

#### Standards

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**Use place value understanding and properties of operations to perform multi-digit arithmetic.**

**3.NBT.1:** Use place value understanding to round whole numbers to the nearest 10 or 100.

**3.NBT.2:** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

**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 problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line.<sup>5</sup>

**3.MD.2:** Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). 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.<sup>6</sup>

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**2.NBT.3** Read & write numbers to 1000 using base-ten numerals, number names, & expanded form.

**2.NBT.7** Add & subtract within 1000, using concrete models or drawings & strategies based on place value, properties of operations, &/or the relationship between addition & subtraction: relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds & hundreds, tens & tens, ones & ones; & sometimes it is necessary to compose or decompose tens or hundreds.

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### Unit 3: Multiplication and Division with Factors of 6, 7, 8, and 9

- (5 Weeks)

**DESCRIPTION:** The “6, 7, 8, and 9” facts will prepare students to learn about area. Students often find it difficult to distinguish the different squares in a rectangle array area model, count them, and recognize that the count is related to multiplication until they have worked extensively with a Rekenrek and/or pictures of rectangular arrays involving objects only (stars, disks, etc.) The Mathematical Practices should be evident throughout instruction and connected to the content addressed in this unit. Students should engage in mathematical tasks that provide an opportunity to connect content and practices.

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**3.OA.9:** Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even and explain why 4 times a number can be decomposed into two equal addends.

**Use place value understanding and properties of operations to perform multi-digit arithmetic.**

**3.NBT.3:** Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g.,  $9 \times 80$ ,  $5 \times 60$ ) using strategies based on place value and properties of operations.

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### Unit 4: Multiplication and Area - (4 Weeks)

**DESCRIPTION:** Area is the number of *area units* in a given shape. When that shape is a rectangle with whole number side lengths, it is easy to partition the rectangle into squares with equal areas. The area of each square is then a fraction of the area of the rectangle. The goal is for students to transition from thinking of fractions as parts of a figure to points on a number line. The Mathematical Practices should be evident throughout instruction and connected to the content addressed in this unit. Students should engage in mathematical tasks that provide an opportunity to connect content and practices.

#### Standards

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**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.

- 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.
- 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.

- 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.
- 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.
- 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  $a \times b$  and  $a \times c$ . Use area models to represent the distributive property in mathematical reasoning.
- 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.

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### Unit 5: Fractions as Numbers on the Number Line – (7 Weeks)

**DESCRIPTION:** Students will have to think of fractions as special types of units: Forming fractional units is exactly the same as what was done for multiplication, but the “group” is not allowed to be the amount when a whole unit is subdivided equally. “1 fourth” is the length of a segment on the number line such that the length of 4 concatenated fourth segments on the line equals 1. Once the unit “1 fourth” has been established, counting them is as easy as counting whole numbers: 1 fourth, 2 fourths, 3 fourths, 4 fourths, 5 fourths, etc. The Mathematical Practices should be evident throughout instruction and connected to the content addressed in this unit. Students should engage in mathematical tasks that provide an opportunity to connect content and practices.

#### Standards

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#### 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.2:** Understand a fraction as a number on a number line; represent fractions on a number line diagram.

- Represent a fraction  $1/b$  on a number line; diagram by defining the interval from 0 to 1 as the whole and positioning it into equal  $b$  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.
- Represent a fraction  $a/b$  on a number line diagram by marking off 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.

**3.NF.3:** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

- Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
- 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.
- Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form  $3 = 3/1$ ; recognize that  $6/1 = 6$ ; locate  $4/4$  and 1 at the same point of a number line diagram.
- 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.

#### Reason with shapes and their attributes.

**3.G.2:** Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area and describe the area of each part as  $1/4$  of the area of the shape.

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### Unit 6: Collecting and Displaying Data – (2 Weeks)

**DESCRIPTION:** Students will learn to estimate lengths to the nearest halves and fourths of an inch and record that information in bar graphs and line plots. This unit also prepares students for the multiplicative comparison problems of grade 4 by asking students “how many more” and “how many less” questions of scaled bar graphs. The Mathematical Practices should be evident throughout instruction and connected to the content addressed in this unit. Students should engage in mathematical tasks that provide an opportunity to connect content and practices.

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#### Represent and interpret data.

**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. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.

**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.

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### Unit 7: Quadrilaterals and More Challenging Word Problems– (8 Weeks)

**DESCRIPTION:** Students will solve word problems and practice fluency for concepts and skills initiated earlier in the year. The Mathematical Practices should be evident throughout instruction and connected to the content addressed in this unit. Students should engage in mathematical tasks that provide an opportunity to connect content and practices.

#### Standards

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#### Represent and solve problems involving multiplication and division.

**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.

#### 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.<sup>3</sup>

#### 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: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

**3.MD.8:** Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

#### 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.