

## Sequence of Kindergarten Modules Aligned with the Standards

Module 1: Numbers to 10

Module 2: Two-Dimensional and Three-Dimensional Shapes

Module 3: Comparison of Length, Weight, Capacity, and Numbers to 10

Module 4: Number Pairs, Addition and Subtraction to 10

Module 5: Numbers 10–20 and Counting to 100

Module 6: Analyzing, Comparing, and Composing Shapes

### Summary of Year

Kindergarten mathematics is about (1) representing, relating, and operating on whole numbers, initially with sets of objects; and (2) describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.

**Key Areas of Focus for K–2:** Addition and subtraction—concepts, skills, and problem solving

**Required Fluency:** K.OA.5 Add and subtract within 5.

### Major Emphasis Clusters

#### Counting and Cardinality

- Know number names and count sequence.
- Count to tell the number of objects.
- Compare numbers.

#### Operations and Algebraic Thinking

- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

#### Number and Operations in Base Ten

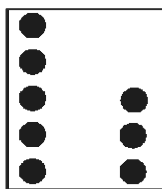
- Work with numbers 11–19 to gain foundations for place value.

### Rationale for Module Sequence in Kindergarten

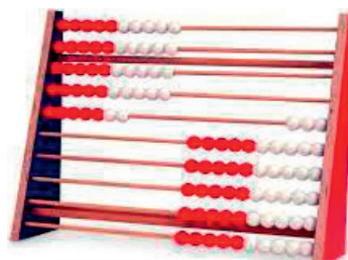
*A Story of Units* continues in Kindergarten. Just like in Pre-K, ladybugs, fingers, and plastic bears are manipulated and counted in Kindergarten, with work consistently moving to the pictorial and abstract levels. The new, foundational unit introduced in Kindergarten’s Module 5, is the supremely important unit of *one*. By the end of the Kindergarten year, students’ first steps into place value are evidenced as they make precise statements such as, “12 is the same as 10 ones and 2 ones!” Notice how this sets the foundation for later work with decimal units (e.g., in Grade 1, “12 is the same as 1 ten and 2 ones;” in Grade 2, “12 tens is the same as 10 tens and 2 tens or 1 hundred 2 tens;” and in Grade 4, “12 tenths is the same as 10 tenths and 2 tenths or 1 one and 2 tenths”).

To begin the year, Kindergarten students start out classifying and categorizing objects, leading to making one group (e.g., “I made a group of 9 goldfish. Look how I can count them in a line, in rows, and in a circle”). Students learn the way each number from 0 to 10 relates to five using fingers,

cubes, drawings, 5-groups (pictured below) and the Rekenrek, an abacus with a color change after the fifth bead (pictured below). The materials support students in seeing all numbers to ten in relationship to five, as they also see them on their fingers, the best manipulative of all! This renders 6, 7, 8, 9, and 10 more friendly as they see, for example, the 3 and 5 embedded within 8. Notice how the distribution of 8 beads as 5 beads and 3 beads sets the stage for the distributive property in Grade 3 (“8 fours = 5 fours + 3 fours, so  $(5 \times 4) + (3 \times 4) = 20 + 12 = 32$ ”). Students close the module by investigating patterns of *1 more* and *1 less* (excluding the word *than*) using models such as the number stairs (pictured below right) with a color change after the fifth cube.



5-Group Card



Rekenrek



Number Stairs

In Module 2, students take a needed break from numbers to analyze their environment and describe and identify squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres. During both Modules 2 and 3, students also practice their fluency by counting and manipulating numbers to 10 during their fluency practice, giving them ample time to prepare for the addition and subtraction of Module 4.

In Module 3, students directly compare two quantities, first learning to identify the attribute being compared. The use of the word *than* is carefully developed first in the context of length (e.g., *taller than*, *shorter than*), then weight (*heavier than*, *lighter than*), and finally capacity. Notice how *more than* and *less than* are used to compare capacities (e.g., “The bucket holds *more than* the cup”). This transitions students smoothly into comparing numbers (e.g., “9 chairs is *more than* 6 chairs”). This concrete foundation for comparison is essential to students’ entire K–12 experience. Ask any Grade 5 teacher which of the two following word problems is more challenging for students:

- There are 34.6 kilograms of sand and 3 kilograms more gravel than sand. What is the total weight of the gravel and sand?
- There are 34.6 kilograms of sand and 3 times as much gravel. What is the total weight of the gravel and the sand?

Problem (a) is more challenging because of the language of *more than*. Students consistently struggle to reason about the relationship of quantities, often resorting to using ineffective tricks (e.g., “If the problem says *more than*, subtract,” which is not correct in the sand and gravel problem). Module 3 in Kindergarten is intended to provide a solid foundation to future comparison work in the meaningful context of measurement.

In Module 4, comparison flows into addition and subtraction, as it does in all the elementary grades (e.g., “7 is more than 3” leads to, “ $7 = 3 + 4$ ,” and “ $3 + 4 = 7$ ”). Students represent *add to*, *take away*, and *put together* stories with blocks, drawings, and equations. Toward the end of the module,

students start to reorient from 5 toward 10 ones with “How much more does 7 need to make ten?” These final lessons set the stage for Module 5 wherein 10 ones is the structure on which students build the teen numbers. They are also critical foundation standards for Grade 1. Students must know how much a number needs to make ten in order to use the *make ten* strategy in Grades 1 and 2, shown to be an important route to place value understanding as they master their sums and differences to 20 by the end of Grade 2.

In Module 5, after an extended experience of addition and subtraction with totals up to 10, students progress to investigating numbers 10–20. For example, thirteen beans are decomposed as 10 beans and 3 beans just as 8 beans are decomposed as 5 beans and 3 beans. Students record their decompositions of the teen numbers as equations,  $13 = 10 + 3$ , and start to think, “10. 3 more is 13.” As mentioned at the beginning of the story in Grade 1, the unit *one* is introduced as students learn to think of the teen numbers as 10 ones and some ones. For the first time, *one* is not an object but rather a noun! Notice how this sets the stage for expanded form in the upper grades (e.g.,  $36 = 30 + 6$ , or  $13.6 = 10 + 3 + 0.6$ ).

Module 6 rounds out the year with an exploration of shapes. Students build shapes from components, analyze and compare them, and discover that they can be composed of smaller shapes, just as larger numbers are composed of smaller numbers.

### Alignment Chart<sup>9</sup>

Module and Approximate Number of Instructional Days	Standards Addressed in Kindergarten Modules
<b>Module 1:</b> <b>Numbers to 10</b> <sup>10</sup> (43 days)	<p><b>Know number names and the count sequence.</b><sup>11</sup></p> <p><b>K.CC.3</b> 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).</p> <p><b>Count to tell the number of objects.</b><sup>12</sup></p> <p><b>K.CC.4</b> Understand the relationship between numbers and quantities; connect counting to cardinality.</p> <p>a. 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.</p>

<sup>9</sup> When a cluster is referred to in this chart without a footnote, the cluster is addressed in its entirety.

<sup>10</sup> In this module, standards work is limited to within 10.

<sup>11</sup> The balance of this cluster is addressed in Module 5.

<sup>12</sup> K.CC.4d is addressed in Module 6.

Module and Approximate Number of Instructional Days	Standards Addressed in Kindergarten Modules
	<p>b. 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.</p> <p>c. Understand that each successive number name refers to a quantity that is one larger.</p> <p><b>K.CC.5</b> 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.</p> <p><b>Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</b><sup>13</sup></p> <p><b>K.OA.3</b> 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., <math>5 = 2 + 3</math> and <math>5 = 4 + 1</math>).</p> <p><b>Classify objects and count the number of objects in each category.</b></p> <p><b>K.MD.3</b> Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10.)</p>
<p><b>Module 2:</b> <b>Two-Dimensional and Three-Dimensional Shapes</b> (12 days)</p>	<p><b>Classify objects and count the number of objects in each category.</b></p> <p><b>K.MD.3</b> Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10.)</p> <p><b>Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).</b></p> <p><b>K.G.1</b> Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as <i>above</i>, <i>below</i>, <i>beside</i>, <i>in front of</i>, <i>behind</i>, and <i>next to</i>.</p> <p><b>K.G.2</b> Correctly name shapes regardless of their orientations or overall size.</p>

<sup>13</sup> The balance of this cluster is addressed in Module 4.

Module and Approximate Number of Instructional Days	Standards Addressed in Kindergarten Modules
	<p><b>K.G.3</b> Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).</p> <p><b>Analyze, compare, create, and compose shapes.</b><sup>14</sup></p> <p><b>K.G.4</b> 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).</p>
<p><b>Module 3:</b> <b>Comparison of Length, Weight, Capacity, and Numbers to 10</b> (38 days)</p>	<p><b>Compare numbers.</b></p> <p><b>K.CC.6</b> 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. (Include groups with up to ten objects.)</p> <p><b>K.CC.7</b> Compare two numbers between 1 and 10 presented as written numerals.</p> <p><b>Describe and compare measurable attributes.</b></p> <p><b>K.MD.1</b> Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.</p> <p><b>K.MD.2</b> 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. <i>For example, directly compare the heights of two children and describe one child as taller/shorter.</i></p>
<p><b>Module 4:</b> <b>Number Pairs, Addition and Subtraction to 10</b> (47 days)</p>	<p><b>Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</b></p> <p><b>K.OA.1</b> Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem.)</p> <p><b>K.OA.2</b> Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.</p>

<sup>14</sup> The balance of this cluster is addressed in Module 6.

Module and Approximate Number of Instructional Days	Standards Addressed in Kindergarten Modules
	<p><b>K.OA.3</b> 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., <math>5 = 2 + 3</math> and <math>5 = 4 + 1</math>).</p> <p><b>K.OA.4</b> 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.</p> <p><b>K.OA.5</b> Fluently add and subtract within 5.<sup>15</sup></p>
<p><b>Module 5:</b> <b>Numbers 10–20 and Counting to 100</b> (30 days)</p>	<p><b>Know number names and the count sequence.</b></p> <p><b>K.CC.1</b> Count to 100 by ones and by tens.</p> <p><b>K.CC.2</b> Count forward beginning from a given number within the known sequence (instead of having to begin at 1).</p> <p><b>K.CC.3</b> 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).</p> <p><b>Count to tell the number of objects.<sup>16</sup></b></p> <p><b>K.CC.4</b> Understand the relationship between numbers and quantities; connect counting to cardinality.</p> <p>b. 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.</p> <p>c. Understand that each successive number name refers to a quantity that is one larger.</p> <p><b>K.CC.5</b> 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.</p>

<sup>15</sup> From this point forward, fluency practice is part of students’ on-going experience.

<sup>16</sup> K.CC.4a, K.CC.4b, and K.CC.4c are addressed in Module 1; K.CC.4d is addressed in Module 6.

Module and Approximate Number of Instructional Days	Standards Addressed in Kindergarten Modules
	<p><b>Work with numbers 11–19 to gain foundations for place value.</b></p> <p><b>K.NBT.1</b> 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 (such as <math>18 = 10 + 8</math>); understand that these numbers are composed of ten ones and one, two three, four, five, six, seven, eight or nine ones.</p>
<p><b>Module 6:</b> <b>Analyzing, Comparing, and Composing Shapes</b> (10 days)</p>	<p><b>Count to tell the number of objects.<sup>17</sup></b></p> <p><b>K.CC.4</b> Understand the relationship between numbers and quantities: connect counting to cardinality.</p> <p>d. Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers.<sup>18</sup></p> <p><b>Analyze, compare, create and compose shapes.<sup>19</sup></b></p> <p><b>K.G.5</b> Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.</p> <p><b>K.G.6</b> Compose simple shapes to form larger shapes. <i>For example, “Can you join these two triangles with full sides touching to make a rectangle?”</i></p>

<sup>17</sup> Ordinality is introduced in the context of constructing and manipulating shapes. The balance of this cluster is addressed in Modules 1 and 5.

<sup>18</sup> K.CC.4d originates from the New York State Common Core Learning Standards and is not part of the CCSS-M.

<sup>19</sup> K.G.4 is addressed in Module 2.