LCCS Kindergarten Math] Curriculum Overview

Month	Unit
September	Unit 1: Math Is..
September	Unit 2: Numbers to 5
October	Unit 3: Numbers to 10
October	Unit 4: Sort, Classify, and Count Objects
November	Unit 5: 2-Dimensional Shapes
December	Unit 6: Understand Addition
January	Unit 7: Understand Subtraction
January	Unit 8: Addition and Subtraction Strategies
February	Unit 9: Numbers 11 to 15
March	Unit 10: Numbers 16-19
April	Unit 11: 3-Dimensional Shapes
May	Unit 12: Count to 100
May	Unit 13: Analyze, Compare and Compose Shapes
June	Unit 14: Compare Measurable Attributes

Unit 1: Math Is..

At a Glance:

The focus of this unit is threefold:

- to build students' agency as doers of mathematics. It is important that students understand that math is not just something done in school. Math is part of our daily lives and shows up in almost every activity. It is also important that students see themselves as skilled doers of math, so helping them understand that doing math is not just carrying out operations or calculations. Rather, doing math is more accurately making sense of and solving problems and finding patterns and relationships among quantities and numbers. Lesson 1-1 helps students see themselves as doers of math as they examine their attitudes towards math and their images of themselves as doers of math.

- to introduce students to the habits of mind that are integral to doing mathematics. These include the thinking that makes up the problem-solving process and that is involved in finding patterns and relationships among quantities and values. Lessons 1-2 through 1-5 focus on helping students understand these habits of mind.
- to build understanding of the norms of interaction that allow for a productive math learning environment where students can develop, refine, and enhance the habits of mind that are integral to doing math. Lesson 1-6 offers the opportunity for students to develop together the classroom norms for math for the school year.

Timeline:
10 Days

Unit 2: Numbers to 5

At a Glance:

This unit develops early quantitative reasoning skills as students count and compare numbers to 5. Students practice the sequence of number names as they count to 5. They learn the relationships between number names and quantities—and that each later number that is counted in a sequence, the greater the quantity it represents. Specifically, each successive number they count refers to a quantity that is one greater than the previous number. Students apply the strategies of one-to-one correspondence and counting when they determine if the number of objects in one group is greater than, is less than, or is equal to the number of objects in another group.

When counting, students learn to pair each object with one and only one number name. Students apply this concept when they understand that the number word they say last as the objects in the group and that the last number they count represents the total number of objects counted.

Students discover that the number of objects in a group is the same regardless of the arrangement of the objects or the order in which the objects are counted.

Students make comparisons by matching objects from one group with objects from another group. After matching the objects of two groups, students determine if the groups are equal or one group is greater or less. Students also count objects in each group, then determine in which group the number of objects is greater or less.

Timeline:
15 Days

Unit 3: Numbers to 10
At a Glance: In the previous unit, students developed an understanding of the numbers 0–5. In this unit, students continue with numbers through 10. Students also will write numbers through 10. In this unit, students count objects up to 10, shown in a line as well as scattered and various arrangements. Students are reminded that the number of objects in a group does not change when the arrangement changes and that the last number said when counting a group tells how many are in the group. Students will compare groups of up to 10 objects by matching and counting the objects in each group. Students will use the words more, less, greater than, less than, same, and equal when comparing the two groups. Students used various counting methods with numbers 0–5 in the previous unit, and they will continue to use them for numbers up to 10. All methods rely on students knowing that the last number they say when counting is the total number of objects in the group. Students will learn to write numbers through 10. Students will be taught the proper steps in making each number and the number will be connected to representing a group of objects.   **Timeline:** 18 Days

Unit 4: Sort, Classify, and Count Objects
At a Glance: In this unit, Kindergarten students are introduced to the idea that objects have different characteristics or attributes that define them, such as the shape, size, and color of an object. These attributes are used to identify how objects are alike and how they are different. Students analyze objects that are the same shape but different sizes or the same size but different colors. Once students understand that objects can be described using attributes such as shape, size, and color, the objects can be sorted. Objects with similar attributes are grouped together. Students also explore the idea that the same group of objects can be sorted in different ways, showing students that there are multiple ways to think about groupings. Finally, students are shown that counting can help them think about groups. Students use strategies such as touching or moving each object as it is counted to count the total number in the group. Number labels are shown under each group, building a connection between the numeral and the number of objects. Students learn to compare the numbers of objects in two or three different groups. Using words like more, fewer, most, fewest,

and equal in their comparisons prepares students for comparing numbers in Grade 1.

Timeline:
8 Days

Unit 5: 2-Dimensional Shapes

At a Glance:

Students are introduced to geometry in Kindergarten, starting with 2-dimensional shapes. The shapes include triangles, squares, rectangles, circles, and hexagons. Shapes are identified by the number of sides and vertices. By counting and numbering the sides and vertices, students identify various examples of each shape.

Shapes are defined by their characteristics. Students need to know that squares always have four equal sides, for example, and that circles always have no sides. These attributes not only describe but also identify the shapes. This can be a difficult concept in Kindergarten for some students.

After students identify shapes, they learn to describe the position of these shapes in their environment. These descriptions are made using various position words such as above, beside, next to, below, and below. These terms will be used throughout students' work in mathematics in various ways, including future geometry units in grades 1 and 2 involving relative positions of objects as well as shape. Identifying shapes and describing their location promotes the use of clarifying language that will be useful in Kindergarten and beyond.

Timeline:
9 Days

Unit 6: Understand Addition

At a Glance:

In this unit, students are introduced to basic addition concepts through 10. They use drawings and objects to concretely represent addition stories, to add one part to another part, and learn to put two groups together. Students are introduced to the plus and equal signs, and learn how to use these signs to represent addition situations symbolically. Students also solve word problems involving "add to" and "put together" situations.

To solve problems, students gradually move from using the word and to using the plus sign (+) to connect and add two numbers, and from using the word is to using the equal sign. The equal sign (=) is a symbol that means, "the amount on one side of the sign is the same as the amount on the other side." It is read, "is equal to." Students may use the words interchangeably.

Timeline:
9 Days

Unit 7: Understand Subtraction

At a Glance:

In this unit, students develop basic subtraction concepts within 10. They use objects, drawings, and equations to represent subtraction stories. Students begin by representing and solving subtraction situations that involve taking apart a group of objects. Then they represent and solve subtraction situations involving taking one part from a larger group. Students learn various strategies to represent subtraction stories, such as counting, using objects, drawing pictures, and acting out the problem. These early number stories provide context for students to understand subtraction and develop problem-solving skills. Students also use objects and drawings to create their own subtraction stories.

As they represent subtraction stories, students draw upon their knowledge of decomposing numbers. For example, to take 3 cubes from 10 cubes, they may think of decomposing 10 as 3 and 7. Thus, when 3 cubes are taken away, 7 cubes are left. So 10 – 3 = 7. At the end of the unit, students solve addition and subtraction problems, allowing them to connect the operations. Extending the example above, students begin to understand how writing 10 – 3 = 7 to represent taking 3 cubes from 10 cubes is related to writing 7 + 3 = 10 to represent adding cubes to 7 cubes.

To solve subtraction problems, students gradually move from using words such as take away and is to use the minus and equal signs. The minus sign (–) connects two numbers and means "subtract the second number from the first." The equal sign (=) means "the amount on one side of the sign is the same as the amount on the other side." Students learn that an equation can represent a subtraction story.

Timeline:
9 Days

Unit 8: Addition and Subtraction Strategies

At a Glance:

Composing and decomposing numbers is about recognizing and representing numbers as combinations of smaller numbers. In this unit, students develop skill in finding multiple ways to make a given number (compose) or break apart a given number (decompose). Separate lessons for composing numbers and for decomposing numbers are provided for numbers 6 and 7, 8 and 9, and 10. The ability to compose and decompose numbers is foundational for developing addition and subtraction strategies. Having this flexibility with numbers—an understanding that any number can be named in a variety of equivalent ways—also supports students when they later multiply and divide.

In each lesson, students compose or decompose with groups of objects. After students show how two groups of objects make a given number of objects (for example, 4 red blocks and 3 blue blocks to the one group to make 7 blocks), they show what is happening symbolically using plus, minus, and equal signs.

Composing and decomposing numbers also involves critical-thinking skills. Throughout this unit, students develop an ability to visualize amounts within a group of objects without having to count each object in the group. As students build their composing and decomposing skills, they begin to think of all possible groupings to make or break apart a given number.

Timeline:
14 Days

Unit 9: Numbers 11 to 15

At a Glance:

In this unit, students learn to represent a group of 11 to 15 objects. They also learn how to compose and decompose groups of 11 to 15 objects into ten ones and some more ones.

Students begin by counting a group of 11, 12, and 13 objects arranged in lines, arrays, and circles. They represent a group using physical manipulatives and a numeral. Then, students learn to compose (make) and decompose (break apart) numbers 11 to 15 into ten ones and some more ones. They compose these numbers using counters and ten-frames, and decompose them using connecting cubes and number bonds.

Composing and decomposing numbers builds critical thinking skills as students develop the ability to visualize amounts of objects. They also gain a foundation for addition and subtraction skills as they begin to think of all possible groupings to make or break apart a given number. Finally, focusing on teen numbers lays a foundation for understanding place value in terms of tens and ones, a concept that students will explore in first grade.

Timeline:
10 Days

Unit 10: Numbers 16 to 19

At a Glance:

In Kindergarten, students practice composing and decomposing numbers to gain the ability to recognize and represent numbers as combinations of smaller numbers. In this unit, students work through several lessons that focus on the numbers 16 to 19, developing skills to make (compose) or break apart (decompose) a given number. Students also practice writing the numerals 16, 17, 18, and 19.

Additionally, work with these teen numbers focuses on the idea that each number is made up of one group of ten ones and some more ones. Students in Kindergarten are given multiple opportunities to compose, decompose, and represent numbers that will contain one group of ten ones and some more ones.

Composing and decomposing numbers develops critical thinking skills, as students develop the ability to visualize numbers of objects. Students also gain a foundation for addition and subtraction skills, because they begin to think of all possible groupings to make or break apart a given number. Finally, focusing on teen numbers lays a foundation for understanding of place value in terms of tens and ones, a concept that students will explore in Grade 1.

Timeline:
15 Days

Unit 11: 3-Dimensional Shapes

At a Glance:

In an earlier unit, kindergarten students were introduced to 2-dimensional shapes. These shapes are defined as flat shapes. Students learned to identify triangles, squares, rectangles, hexagons, and circles by their number of sides. They examined both regular and real-world examples of these shapes.

This unit introduces 3-dimensional shapes. A 3-dimensional shape is defined as a solid shape. The first lesson asks students to identify whether objects are 2-dimensional or 3-dimensional shapes.

As this may be a kindergartener's first formal experience with 3-dimensional shapes, it is important to make connections between 2- and 3-dimensional shapes. For example, a cylinder has a circular base on each end. Promote these connections and encourage students to use the geometric vocabulary they learned in the earlier unit when describing the 3-dimensional shapes.

Once students are able to identify 3-dimensional shapes, each solid is further examined and explored. A cube has six faces that are the same size and shape (square) and eight vertices. A sphere is round. A cylinder has a curved surface and two bases that are the same shape (circle). A cone has a curved surface, a circular base, and an apex. Students also identify if the solid shapes are able to roll and/or stack.

Finally, students identify the positions of solid shapes in real-world contexts using the words above, behind, below, beside, in front of, and next to.

Timeline:
10 Days

Unit 12: Count to 100

At a Glance:
In this unit, students extend their counting skills to count to 100. Separate lessons are provided that focus on how to count by 1s through 50 and through 100. Students also develop an understanding of counting by 10s. Up to this point, students have only counted by 1s. They may not be familiar with the concept of counting by 10s.

As students become proficient with counting by 10s, they begin to explore patterns on the hundred chart that relate to groupings of 10. For example, they note that every number in the right column ends in 0, and that every number in a row begins with the same digit, and that the second digit of each number follows the 0–9 counting sequence.

Counting by 10s and observing a hundred chart develop early place-value concepts. As students count each group of 10, they observe that 1 ten is the same as 10 ones. They will begin a formal exploration of place-value in Grade 1.

The fourth lesson in this unit focuses on counting from any given number to 100. Here students practice counting up from a number other than 1. Counting forward beginning from a number other than 1 occurs in everyday life, such as in a situation where a group of objects has already been counted and more objects need to be added to the count. The final lesson extends the idea that counting tells how many by emphasizing that this number is consistent even if the objects are arranged differently or counted in a different order.

Timeline:
9 Days

Unit 13: Analyze, Compare, and Compose Shapes

At a Glance:

In this unit, students compare, contrast, and create two- and three-dimensional shapes. They distinguish objects that are two-dimensional (flat) from those that are three-dimensional (solid). Students draw two-dimensional shapes and build three-dimensional shapes. They also identify three-dimensional shapes among the real-world objects around them.

A two-dimensional shape is a shape that is confined to a flat surface. Students discover that changing the size or orientation of a shape does not change the name of the shape. Students recognize and draw shapes based on the number of their sides, the length of their sides, and the number of vertices (plural for vertex). A vertex of a two-dimensional shape is the point where sides meet. Initially some students may be more comfortable using the word corner rather than vertex, but it is important for students to eventually use the more precise language.

A three-dimensional shape is a solid shape. Students learn that a three-dimensional object is something that they can hold or pick up. Students gain experience recognizing and building various three-dimensional shapes.

When students identify two- and three-dimensional shapes, they are separating the shapes that are in the desired category from the other shapes. They recognize common and distinct attributes among shapes. This promotes an appreciation of mathematical structure—a practice that is developed across mathematical topics throughout the grades.

Timeline:
10 Days

Unit 14: Compare Measurable Attributes

At a Glance:

In this unit, students build on their earlier work sorting objects according to attributes (such as size, color, and shape) to identify, describe, and compare measurable attributes of objects. A measurable attribute of an object is a characteristic of the object that can be quantified. Students work with measurable attributes of length, weight, height, and capacity. They learn that when two objects have a measurable attribute in common, the measurable attribute of one compared. They determine which object has more of or less of the attribute than the other — or if the two have the same amount. They use descriptive words to describe the comparison by concluding, for example, that a particular object is longer than another object. In Grade 1, students use tools and non-standard units (such as connecting cubes) to measure and compare length.

Length is the distance from one end of an object to the other. Students learn to directly compare length by placing one object next to the other— with the objects lined up at one end. When the objects are in a horizontal orientation (going across), students use descriptive words such as longer and shorter when making comparisons.

Height generally refers to the length of an object when it is in a vertical orientation. Terms such as taller and shorter are used when comparing heights.

Weight is a measure of how heavy an object is. Students compare the weights of objects by placing objects on either side of a balance scale. Students observe that the side that goes down has more weight than the other side.

Capacity is a measure of the amount of space a container can hold. (The terms capacity and volume are often used interchangeably.

Timeline:
9 Days