Bristol Public Schools

Office of Teaching & Learning

Department	Mathematics
Department Philosophy	*Students learn by doing math, solving problems in mathematical and real-world contexts, and constructing arguments using precise language.* The Bristol mathematics curricula embeds this *learn-by-doing* philosophy by focusing on high expectations for all students and providing students with opportunities that build conceptual understanding, computational and procedural fluency, and problem solving through the use of a variety of strategies, tools, and technologies. The mathematics curriculum is responsive to the individual needs of students, while providing a structure tied to the Common Core State Standards in Connecticut. The *learn-by-doing* philosophy develops mathematically literate and productive students who can effectively and efficiently apply mathematics in their lives to make informed decisions about the world around them by doing math. To be mathematically literate, one must understand major mathematics concepts, possess computational facility, and have the ability to apply these understandings to situations in daily life. Making connections between mathematics and other disciplines is key to the appropriate application of mathematics skills and concepts to solve problems. The ability to read, discuss, and write within the discipline of mathematics is an integral skill that supports mathematical understanding, reasoning and communication. The opportunity to think critically and creatively to solve problems is important to deepen mathematical knowledge and foster innovation. A rich hands-on mathematical experience is essential to provide the foundational knowledge and skills that prepare students to be mathematically literate, productive citizens.
Course	Grade K Mathematics
Grade Level	Grade K
Pre-requisites	

Table of Contents

M-Major Cluster, S-Supporting Cluster, A-Additional Cluster

District Learning Expectations and Standards	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8 (optional)
Counting and Cardinality								
Know number names and the count sequence.								
K.CC.A.1 Count to 100 by ones and by tens.	M	M	M	M	M	M	M	M
K.CC.A.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).				M	M	M		M
K.CC.A.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).		M	M	M	M	M	M	M
Count to tell the number of objects.								
K.CC.B.4 Understand the relationship between numbers and quantities; connect counting to cardinality.	M	M				M		M
K.CC.B.4.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.	M					M		
K.CC.B.4.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.		M				M		
K.CC.B.4.C Understand that each successive number name refers to a quantity that is one larger.		M	M	M				M
K.CC.B.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		M	M	M	M	M	M	M

many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.								
Compare numbers.								
K.CC.C.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.		M	M				M	M
K.CC.C.7 Compare two numbers between 1 and 10 presented as written numerals.		M					M	
Operations & Algebraic Thinking								
Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.								
K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings1, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.				M	M	M	M	M
K.OA.A.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.				M	M	M	M	M
K.OA.A.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).					M		M	M
K.OA.A.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.					M		M	M
K.OA.A.5 Fluently add and subtract within 5.					M	M	M	M
Number & Operations in Base Ten								
Work with numbers 11-19 to gain foundations for place value.								

K.NBT.A.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 (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.						M	M	M
Measurement & Data								
Describe and compare measurable attributes.								
K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.							A	
K.MD.A.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. For example, directly compare the heights of two children and describe one child as taller/shorter.			A				A	
Classify objects and count the number of objects in each category.								
K.MD.B.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.			S				S	S
Geometry								
Identify and describe shapes.								
K.G.A.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.			A				A	
K.G.A.2 Correctly name shapes regardless of their orientations or overall size.			A				A	
K.G.A.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").							A	

Analyze, compare, create, and compose shapes.								
K.G.B.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).			S				S	
K.G.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.			S				S	
K.G.B.6 Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"			S				S	

UNIT 1: MATH IN OUR WORLD

Illustrative Mathematics Unit Focus: Students recognize numbers and quantities in their world.

Essential Questions:
Why do we count?
How are numerals used?
How can two quantities be related?

Unit Pacing: 18 days (16 required lessons, 2 flex)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
K.CC.A.1 Count to 100 by ones and by tens.	Several progressions originate in knowing number names and the count sequence. Students usually know or can learn to say the counting words up to a given number before they can use these numbers to count objects or to tell the number of objects. Students become fluent in saying the count sequence so that they have enough attention to focus on the pairings involved in counting objects.	Counting tells how many there are in a set, no matter which order the objects are counted. When counting by ones, the next number in the sequence increases the quantity by one.	Count Number Number words 0 - 20 Ones Tens
K.CC.B.4 Understand the relationship between numbers and quantities; connect counting to cardinality.	Experience with counting allows students to discuss and come to understand the second part of K.CC.4b—that the number of objects is the same regardless of their arrangement or the order in which they were counted.	The last number said when counting a set tells the total number of objects counted. Numerals are the symbols we read and write to communicate quantities (numbers). The quantity of a set does not change based on the arrangement, size, or type of object (conservation).	Number Number words 0 - 20 Count Name Find
K.CC.B.4.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.	To count a group of objects, they pair each word said with one object. This is usually facilitated by an indicating act (such as pointing to objects or moving them) that keeps each word said in time		1:1 matching

	paired to one and only one object located in space.		
K.CC.C.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.	Students first learn to match the objects in the two groups to see if there are any extra and then to count the objects in each group. Students learn that even if one group looks as if it has more objects (e.g., has some extra sticking out), matching or counting may reveal a different result.	One quantity is either greater than, less than or equal to the other.	Compare Equal to Same as Greater than More than Less than Fewer than

UNIT 1: MATH IN OUR WORLD

Why do we count?
How are numerals used?
How can two quantities be related?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Exploring Our Tools				
K.CC K.G K.G.B	I can share my mathematical thinking in the classroom.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students build a shared understanding of what it means to do math and to be a part of a mathematical community, where everyone's contributions are valued. They collaborate to create norms for their work together. They are also encouraged to share their ideas and listen to others', make connections between their work and their home life, and to see themselves as productive mathematical thinkers. Students also interact with the tools that they will use in math activities and centers throughout the year. They have the opportunity to freely explore the tools and think of their mathematical purposes before choosing a tool for use in structured activities later in the section and in centers. Consider taking the time in this section to	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3, 4, 5

<table>
<tr><td></td><td></td><td></td><td>formatively assess students' counting concepts and skills, observing students or asking them to count small groups of objects while they work, and using the Sections A-D Checkpoint document from the teacher resource pack.</td><td></td></tr>
<tr><td>Pacing:</td><td>5 days</td><td></td><td>Math Practices:
SMP 2, 3, 5, 6</td><td>Assessments:
Checkpoint A-D</td></tr>
<tr><td colspan="5">Section B: Recognize Quantities</td></tr>
<tr><td>K.CC
K.CC.B.4
K.G</td><td>I can subitize up to 4.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students continue to explore numbers and quantities in their classroom, focusing on small groups of objects or images they can quantify without counting. They match groups that have the same number of images and notice that the same quantity can be arranged in many different ways. Students continue to develop the language to express these ideas and to listen to ideas of their peers. Students are sometimes asked to show quantities up to 5 on their fingers. This is a chance to formatively observe if students are comfortable showing quantities on their fingers (any way is acceptable). For example, they may put up 4 fingers to show how many objects there are before saying the number word "four." This section provides continued opportunity to formatively assess students' counting concepts and skills.</td><td>Mandatory Lessons/Activities:
iM Lessons 6, 7, 8, 9</td></tr>
<tr><td>Pacing:</td><td>4 days</td><td></td><td>Math Practices:
SMP 3, 4, 6, 7, 8</td><td>Assessments:
Checkpoint A-D</td></tr>
<tr><td colspan="5">Section C: Are There Enough</td></tr>
<tr><td>K.CC</td><td>I can use 1:1 matching to solve problems.</td><td></td><td>Lesson Progression:
Students work on the concept of one-to-one</td><td>Mandatory Lessons/Activities:
iM Lessons 10, 11, 12</td></tr>
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<tr>
<td>K.CC.B.4
K.G</td>
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<tr><td>X</td><td>Selected Response</td></tr>
<tr><td>X</td><td>Constructed Response</td></tr>
<tr><td></td><td>Performance</td></tr>
<tr><td>X</td><td>Observation</td></tr>
</table>
</td>
<td>correspondence. They match one object to one person or image to answer “are there enough” questions and to get enough objects. This matching skill will be useful in the next section and in future counting when students match one number word to one object. “Are there enough” and “can you get enough” questions encourage students to model situations. Look for ways to incorporate these prompts into other parts of the school day, for example, when classroom supplies are being distributed.</td>
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<tr>
<td>Pacing:</td>
<td>3 days</td>
<td></td>
<td>Math Practices:
SMP 1, 2, 3, 4, 5, 6</td>
<td>Assessments:
Checkpoint A-D</td>
</tr>
<tr>
<td colspan="5">Section D: Counting Collections</td>
</tr>
<tr>
<td>K.CC.A.1
K.CC.B
K.CC.B.4
K.CC.B.4.a
K.CC.B.5
K.CC.C.6
K.G</td>
<td>I can count to tell how many.</td>
<td>
<table>
<tr><td>X</td><td>Selected Response</td></tr>
<tr><td>X</td><td>Constructed Response</td></tr>
<tr><td></td><td>Performance</td></tr>
<tr><td>X</td><td>Observation</td></tr>
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</td>
<td>Lesson Progression:
Students focus on counting up to 10 objects and answering “how many of _____ are there” questions. They learn a new routine, Questions About Us, and consider the question “how many of us are here today?” The routine offers opportunities to highlight one-to-one matching and the idea of keeping track of what is being counted. Students also count collections of objects from the classroom or from home. To initiate counting, ask “how many of _____ are there?” instead of saying “count the objects.” This helps to reinforce counting as a way to quantify a collection and the idea of cardinality—that the last number called tells us how many there are. Students may use counting mats, 5-frames, or other tools to help them count. Representing the numbers 6–10 on a 5-frame, for instance, helps students see the 5 + n structure of these numbers. (The 10-frame will be introduced in a future unit.)

Some students may be able to subitize, or recognize how many objects there are without counting. Those who can do so accurately should not be required to count individual objects. Consider differentiating the size of collections</td>
<td>Mandatory Lessons/Activities:
iM Lessons 13, 14, 15, 16</td>
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			students count based on observations of students' counting. Included in each lesson is an optional activity to support students in certain aspects of counting—verbalizing the count sequence, one-to-one tagging, and organizing objects to count.	
Pacing:	4 days		**Math Practices:** SMP 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Checkpoint A-D

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Some students may not understand that counting is a strategy to determine 'how many' and that the last number counted says how many. Some students may have a mismatch between the oral words and the objects counted (eg, matches objects to syllables, omits certain number names). Some students may not organize the set of objects to avoid counting objects already counted. Students may look at objects and focus on their size, arrangement, or area when making comparisons between groups rather than the number.	K.CC.A.1: CT ELDS M.60.1, K.CC.B.4: CT ELDS M.60.2, M.60.3 K.CC.C.6: CT ELDS M.60.6 Early Learning & Development Standards	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources
RESOURCES			
Kendall Hunt Blackline masters and materials from Teacher Resource Pack 5-frames, Connecting cubes, Cups, Two-color counters, Pattern blocks, Collections of objects			

UNIT 2: NUMBERS 1-10

Illustrative Mathematics Unit Focus: Students answer “how many” questions, count out, and compare groups within 10. Students write a number to represent how many.

Essential Questions:
Why do we count?
How are numerals used?
How can two quantities be related?

Unit Pacing: 27 days (21 required lessons, 4 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
K.CC.A.1 Count to 100 by ones and by tens.	Several progressions originate in knowing number names and the count sequence. Students usually know or can learn to say the counting words up to a given number before they can use these numbers to count objects or to tell the number of objects. Students become fluent in saying the count sequence so that they have enough attention to focus on the pairings involved in counting objects.	Counting tells how many there are in a set, no matter which order the objects are counted. When counting by ones, the next number in the sequence increases the quantity by one.	Count Number Number words 0 - 20 Ones Tens
K.CC.A.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).	Due to varied development of fine motor and visual development,reversal of numerals is anticipated. While reversals should be pointed out to students and correct formation modeled in instruction, the emphasis of this standard is on the use of numerals to represent quantities rather than the correct handwriting formation of the actual numeral itself. While kindergarteners may experiment with writing numbers beyond 20, this standard places emphasis on numbers 0-20. First graders will	Numerals are the symbols we read and write to communicate quantities (numbers)	Count Number Numeral Number words 0 - 20 How many Show Explain Represent

	extend the counting sequence, number recognition and writing to 120.		
K.CC.B.4 Understand the relationship between numbers and quantities; connect counting to cardinality.	Experience with counting allows students to discuss and come to understand the second part of K.CC.4b—that the number of objects is the same regardless of their arrangement or the order in which they were counted.	The last number said when counting a set tells the total number of objects counted. Numerals are the symbols we read and write to communicate quantities (numbers). The quantity of a set does not change based on the arrangement, size, or type of object (conservation).	Number Number words 0 - 20 Count Name Find
K.CC.B.4.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.	Students understand that the last number name said in counting tells the number of objects counted. Prior to reaching this understanding, a student who is asked “How many kittens?” may regard the counting performance itself as the answer, instead of answering with the cardinality of the set. Experience with counting allows students to discuss and come to understand the second part of K.CC.4b—that the number of objects is the same regardless of their arrangement or the order in which they were counted. This connection will continue in Grade 1 with the more advanced counting-on methods in which a counting word represents a group of objects that are added or subtracted and addends become embedded within the total.		
K.CC.B.4.c Understand that each successive number name refers to a quantity that is one larger.	Understanding that each successive number name refers to a quantity that is one larger is the conceptual start for Grade 1 counting on. Prior to reaching this understanding, a student might have to recount entirely a collection of known cardinality to which a single object has been added.		
K.CC.B.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	Counting objects arranged in a line is easiest; with more practice, students learn to count objects in more difficult arrangements, such as rectangular	Counting tells how many there are in a set, no matter which order the objects are counted. The last number said when	Count Number Number words 0 - 20

things in a scattered configuration; given a number from 1-20, count out that many objects.	arrays (they need to ensure they reach every row or column and do not repeat rows or columns); circles (they need to stop just before the object they started with); and scattered configurations (they need to make a single path through all of the objects). Later, students can count out a given number of objects, which is more difficult than just counting that many objects, because counting must be fluent enough for the student to have enough attention to remember the number of objects that is being counted out.	counting a set tells the total number of objects counted.	
K.CC.C.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.	Students first learn to match the objects in the two groups to see if there are any extra and then to count the objects in each group. Students learn that even if one group looks as if it has more objects (e.g., has some extra sticking out), matching or counting may reveal a different result.	One quantity is either greater than, less than or equal to the other.	Compare Equal to Same as Greater than More than Less than Fewer than
K.CC.C.7 Compare two numbers between 1 and 10 presented as written numerals.	Students use their knowledge of the count sequence to decide which number is greater than the other (the number farther along in the count sequence). Comparing numbers progresses in Grade 1 to adding and subtracting in comparing situations (finding out “how many more” or “how many less”and not just “which is more” or “which is less”).		

UNIT 2: NUMBERS 1-10

Why do we count?
How are numerals used?
How can two quantities be related?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Count and Compare Groups of Objects				
K.CC K.CC.A.1 K.CC.A.3 K.CC.B.4 K.CC.B.4.bK .CC.B.5 K.CC.C.6 K.G.B	I can count to tell how many. I can compare two sets.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** In this section, students count to answer "how many" questions and develop their understanding of the connection between quantities and spoken number words. Students are encouraged to use their fingers to count. They may also continue to use any tools and resources from earlier work, such as counting mats and 5-frames, as well as bring objects from home to count. As students count and rearrange objects, students notice that the arrangement of objects does not affect the number of objects (conservation of number). They will continue to build this understanding over time. Students also develop their comparison skills. They start with quantities that are very different and can be compared visually, such as 7 and 2, and relate the comparisons to the terms "more" and "fewer," which may be new. (Students do not need to produce grammatically accurate language, but the teacher should use "fewer" or "less" as appropriate in context.) Display and write the number associated with a quantity whenever possible. Students will begin recognizing, representing, and writing numbers in	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3, 4, 5, 6

<table>
<tr><td></td><td></td><td rowspan="3"></td><td>the second half of the unit.</td><td></td></tr>
<tr><td>Pacing:</td><td>6 days</td><td>Math Practices:
SMP 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Checkpoint A</td></tr>
<tr><td colspan="5">Section B: Count and Compare Groups of Images</td></tr>
<tr><td>K.CC.A.3
K.CC.B
K.CC.B.4
K.CC.B.4.b
K.CC.B.5
K.CC.C.6</td><td>I can count to tell how many.

I can compare two sets.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students begin this section by counting images for the first time. This can be more challenging, as images cannot be rearranged, and students may not have limited experience with keeping track of counted items.

Students encounter groups of images in lines, arrays, 5-frames, number cube arrangements, and on fingers. They may be able to determine the cardinality of some groups of images without counting (subitize), which is a valid way to answer “how many” questions.

Images arranged on 5-frames and images of fingers allow students to work with the structure of “5 and some more.” Repeated experience with this structure can help students see that they can count on from 5 to determine how many images there are. Here, students also answer “are there enough” questions.

“Are there enough cartons of milk for each student? How do you know?”
  </td><td>Mandatory Lessons/Activities:
iM Lessons 7, 8, 9, 10, 11</td></tr>
<tr><td>Pacing:</td><td>5 days</td><td>Math Practices:
SMP 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Checkpoint B</td></tr>
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<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="5">Section C: Connect Quantities and Numbers</td></tr>
<tr><td>K.CC
K.CC.A.1
K.CC.A.3
K.CC.B
K.CC.B.4
K.CC.B.5
K.CC.C.6</td><td>I can show how many in a variety of ways.</td><td rowspan="2"><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Previously, students counted and made connections between quantities and spoken number words. In this section, students write numbers to represent quantities. To develop students’ familiarity with written numbers, consider providing a reference sheet with numbers and quantities in 5-frames.

Students also explore new counting tasks: counting images arranged in a circle, and counting objects or drawing images to represent given numbers. Images arranged in a circle are harder to quantify than those in lines, arrays, or frames because there is no defined starting or stopping point. It requires students to develop a method to keep track of which images they have counted.

Creating or drawing a collection with a specified number of items is also more demanding as students need to keep track of the number they are representing and how many they have already counted. In many activities, students have opportunities to look for and make use of structure to help them with the tasks at hand (MP7).</td><td>Mandatory Lessons/Activities:
iM Lessons 12, 13, 14, 15, 16</td></tr>
<tr><td>Pacing:</td><td>5 days</td><td>Math Practices:
SMP 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Checkpoint C</td></tr>
<tr><td colspan="5">Section D: Compare Numbers</td></tr>
<tr><td>K.CC
K.CC.A.3
K.CC.B.4
K.CC.B.4.c
K.CC.B.5
K.CC.C.6
K.CC.C.7</td><td>I can compare two sets.

I can compare written numbers.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr></table></td><td>Lesson Progression:
In this section, students develop their capacity to compare written numbers. As they count, students can see that the numbers get larger and that there is 1 more each time. Here, they determine “1 more” and “1 less” than a given number or group of objects, strengthening their understanding of</td><td>Mandatory Lessons/Activities:
iM Lessons 17, 18, 19, 20, 21</td></tr>
</table>

		<table><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table>	the relationships between numbers and the foundation for comparing numbers. Students may compare written numbers in several ways: ● Create representations of each number and use the representations to compare. ● Use number sense (for instance, that 10 is a “big” number) or mental images of numbers (for instance, 4 relates to 4 fingers). ● Use the knowledge of the count sequence: that numbers that come later in the count sequence are greater. Students who use number sense or mental images may be able to easily compare some numbers but not others. For instance, they may know that 9 is close to 10 or all the fingers in two hands and 4 is associated with fingers in one hand, so 9 is more than 4.	
Pacing:	6 days		**Math Practices:** SMP 1, 2, 3, 4, 5, 6, 7	**Assessments:** Checkpoint D

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Some students may not understand that counting is a strategy to determine 'how many' and that the last number counted says how many. Some students may have a mismatch between the oral words and the objects counted (eg, matches objects to syllables,	K.CC.A.1: CT ELDS M.60.1 K.CC.A.3: CT ELDS M.60.4 K.CC.B.4: CT ELDS M.60.2, M.60.3, M.60.5 K.CC.B.5: CT ELDS M.60.2, M.60.3 K.CC.C.6: CT ELDS M.60.6 K.CC.C.7: CT ELDS M.60.6	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources

omits certain number names). Some students may not organize the set of objects to avoid counting objects already counted. Some students might not see zero as a number. Students may look at objects and focus on their size, arrangement, or area when making comparisons between groups rather than the number.	Early Learning & Development Standards		
RESOURCES			
Kendall Hunt Blackline masters and materials from Teacher Resource Pack 5-frames, Connecting cubes, Cups, Two-color counters, Pattern blocks			

UNIT 3: FLAT SHAPES ALL AROUND US

Illustrative Mathematics Unit Focus: Students identify, describe, analyze, compare, and compose two-dimensional shapes.

Essential Questions:
How do we describe objects in our world?
How can we name, describe, and analyze two-dimensional shapes?
How can we create new shapes using existing shapes?

Unit Pacing: 24 days (14 required lessons, 8 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
K.CC.A.1 Count to 100 by ones and by tens.	Several progressions originate in knowing number names and the count sequence. Students usually know or can learn to say the counting words up to a given number before they can use these numbers to count objects or to tell the number of objects. Students become fluent in saying the count sequence so that they have enough attention to focus on the pairings involved in counting objects.	Counting tells how many there are in a set, no matter which order the objects are counted. When counting by ones, the next number in the sequence increases the quantity by one.	Count Number Number words 0 - 20 Ones Tens
K.CC.A.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).	Due to varied development of fine motor and visual development,reversal of numerals is anticipated. While reversals should be pointed out to students and correct formation modeled in instruction, the emphasis of this standard is on the use of numerals to represent quantities rather than the correct handwriting formation of the actual numeral itself.	Numerals are the symbols we read and write to communicate quantities (numbers)	Count Number Numeral Number words 0 - 20

	While kindergarteners may experiment with writing numbers beyond 20, this standard places emphasis on numbers 0-20. First graders will extend the counting sequence, number recognition and writing to 120.		
K.CC.B.4 Understand the relationship between numbers and quantities; connect counting to cardinality.	Experience with counting allows students to discuss and come to understand the second part of K.CC.4b—that the number of objects is the same regardless of their arrangement or the order in which they were counted.	The last number said when counting a set tells the total number of objects counted. Numerals are the symbols we read and write to communicate quantities (numbers). The quantity of a set does not change based on the arrangement, size, or type of object (conservation).	Number Number words 0 - 20 Count
K.CC.B.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.	Counting objects arranged in a line is easiest; with more practice, students learn to count objects in more difficult arrangements, such as rectangular arrays (they need to ensure they reach every row or column and do not repeat rows or columns); circles (they need to stop just before the object they started with); and scattered configurations (they need to make a single path through all of the objects). Later, students can count out a given number of objects, which is more difficult than just counting that many objects, because counting must be fluent enough for the student to have enough attention to remember the number of objects that is being counted out.	Counting tells how many there are in a set, no matter which order the objects are counted. The last number said when counting a set tells the total number of objects counted.	Count Number Number words 0 - 20
K.CC.C.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.	Students first learn to match the objects in the two groups to see if there are any extra and then to count the objects in each group. Students learn that even if one group looks as if it has more objects (e.g., has some extra sticking out),	One quantity is either greater than, less than or equal to the other.	Compare Equal to Same as Greater than More than Less than

	matching or counting may reveal a different result.		Fewer than
K.G.A.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.	Students refine their informal language by learning mathematical concepts and vocabulary so as to increasingly describe their physical world from geometric perspectives, e.g., shape, orientation, spatial relations (MP4). They increase their knowledge of a variety of shapes, including circles, triangles, squares, rectangles, and special cases of other shapes such as regular hexagons, and trapezoids with unequal bases and non-parallel sides of equal length. Students also begin to name and describe three-dimensional shapes with mathematical vocabulary, such as "sphere," "cube," "cylinder,"and "cone." Finally, in the domain of spatial reasoning, students discuss not only shape and orientation, but also the relative positions of objects, using terms such as "above," "below," "next to," "behind," "in front of," and "beside."	We can describe objects in our world using geometric ideas, such as names of shapes and positional words.	Above Below In front of Behind Beside Next to Square Circle Triangle Rectangle Hexagon Cube Cone Cylinder Sphere
K.G.A.2 Correctly name shapes regardless of their orientations or overall size.	Students learn to name shapes such as circles, triangles, and squares, whose names occur in everyday language, and distinguish them from nonexamples of these categories, often based initially on visual prototypes.	Naming shapes is not dependent on their position, orientation or size.	
K.G.B.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).	The need to explain their decisions about shape names or classifications prompts students to attend to and describe certain features of the shapes. That is, concept images and names they have learned for the shapes are the raw material from which they can abstract common features.	Two- and three-dimensional shapes can be named, described and analyzed using attributes, such as number and lengths of sides and number of angles/vertices.	
K.G.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	The need to explain their decisions about shape names or classifications prompts students to attend to and describe certain features of the shapes. That is, concept images and names they have learned for the shapes are the raw material from which they can abstract common features.		Round Circle Rectangle Side Square Straight

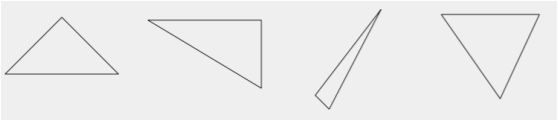
	This also supports their learning to represent shapes informally with drawings and by building them from components (e.g., manipulatives such as sticks). With repeated experiences such as these, students become more precise (MP6).		Triangle Trapezoid Hexagon
K.G.B.6 Compose simple shapes to form larger shapes. For example, “Can you join these two triangles with full sides touching to make a rectangle?”	A second important area for kindergartners is the composition of geometric figures. Students not only build shapes from components,but also compose shapes to build pictures and designs. Initially lacking competence in composing geometric shapes, they gain abilities to combine shapes–first by trial and error and gradually by considering components–into pictures. At first, side length is the only component considered. Later experience brings an intuitive appreciation of angle size. Students combine two-dimensional shapes and solve problems such as deciding which piece will fit into a space in a puzzle, intuitively using geometric motions (slides, flips, and turns, the informal names for translations, reflections, and rotations, respectively). They can construct their own outline puzzles and exchange them, solving each other’s.	New shapes can be created by putting together existing shapes.	
K.MD.A.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. For example, directly compare the heights of two children and describe one child as taller/shorter.	Kindergartners easily directly compare lengths in simple situations, such as comparing people’s heights, because standing next to each other automatically aligns one endpoint. However, in other situations they may initially compare only one endpoint of objects to say which is longer. Discussing such situations (e.g., when a child claims that he is “tallest” because he is standing on a chair) can help students resolve and coordinate perceptual and conceptual information when it conflicts.	Different attributes can be measured, such as length or weight. We measure to determine the amount of a measurable attribute for a given object.	Longer Shorter Taller More of Less of

K.MD.B.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.	Students in Kindergarten classify objects into categories, initially specified by the teacher and perhaps eventually elicited from students. For example, in a science context, the teacher might ask students in the class to sort pictures of various organisms into two piles: organisms with wings and those without wings. Students can then count the number of specimens in each pile. Students can use these category counts and their understanding of cardinality to say whether there are more specimens with wings or without wings.	We sort and classify objects to organize them in groups by common attributes to see relationships among the groups.	Alike Different Shape Size Sort Count

UNIT 3: FLAT SHAPES ALL AROUND US

How do we describe objects in our world?
How can we name, describe, and analyze two-dimensional shapes?
How can we create new shapes using existing shapes?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Exploring Shapes in Our Environment				
K.CC.A.1 K.CC.A.3 K.CC.B K.CC.B.5 K.G.A.1 K.G.A.2 K.G.B.4 K.G.B.5 K.MD.A.2 K.MD.B.3	I can name, describe, and compare shapes.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students work to name, describe, and compare shapes in their environment more precisely. They focus on identifying circles, rectangles, squares, and triangles. Students begin by identifying objects that look like flat shapes in books and in their surroundings. At this point, they are not yet expected to differentiate flat shapes from solid ones. For example, they may relate a tissue box to a rectangle. The difference between flat and solid shapes will be investigated in a later unit. Likewise, students may not yet recognize distinctions in flat shapes with some similar features, such as a circle and an oval. Clarify that a	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9

<table>
<tr><td></td><td></td><td></td><td>shape is or is not as named, while acknowledging the connections students might be making. (“This shape is curved like a circle, but it is not a circle.”) To help expand students’ mental image of shape categories, the shapes seen here are varied in size, type, and orientation.
 
When comparing shapes, students use their own language to describe how shapes are the same and different. They also consider the side length of rectangles and use “longer than” and “shorter than” to describe relative length. They learn that a square is a special kind of rectangle with all four sides having the same length (though are not required to know this definition).</td><td></td></tr>
<tr><td>Pacing:</td><td>9 days</td><td></td><td>Math Practices:
SMP: 3, 5, 6</td><td>Assessments:
Checkpoint A</td></tr>
<tr><td colspan="5">Section B: Making Shapes</td></tr>
<tr><td>K.CC.A.3
K.CC.B.4.c
K.CC.B.5
K.CC.C.6
K.G.A.1
K.G.A.2
K.G.B.6</td><td>I can put shapes together to form new shapes.

I can use positional language to describe shapes in my world.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students develop spatial reasoning by manipulating shapes and solving geometric puzzles while using geometric language from earlier work. Students use pattern blocks to compose geometric figures, explore shapes in different orientations, find shapes that match exactly, and complete puzzles that require reorienting shapes. Throughout the section, students use their own language to describe how the shapes they are working with are alike and different, including descriptions of the side lengths of shapes in their comparison.</td><td>Mandatory Lessons/Activities:
iM Lessons 10, 11, 12, 13, 14</td></tr>
<tr><td>Pacing:</td><td>5 days</td><td></td><td>Math Practices:</td><td>Assessments:</td></tr>
</table>

			SMP: 3, 5, 6, 7, 8	Checkpoint B

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
One of the most common misconceptions in geometry is the belief that orientation, size, or color are tied to shape identification. Students may see the first of the figures below as a triangle, but claim to not know the name of the second or third.  Students may struggle to see a new shape from a composite shape. For example, a triangle and a square create a composite shape - pentagon. Students may see only the triangle and square not the pentagon. Students struggle to identify attributes of a shape that determines the shape name. Students may incorrectly use mathematical vocabulary when comparing objects. When comparing length, students may say bigger or smaller, instead of longer or shorter.	K.CC.A.1: CT ELDS M.60.1 K.CC.A.3: CT ELDS M.60.4 K.CC.B.4: CT ELDS M.60.2, M.60.3, M.60.5 K.CC.B.5: CT ELDS M.60.2, M.60.3 K.CC.C.6: CT ELDS M.60.6 K.CC.C.7: CT ELDS M.60.6 K.MD.A.2: CT ELDS M.60.9, M.60.10 K.MD.B.3: CT ELDS M.60.12 K.G.A.1: CT ELDS M.60.13, M.60.14 K.G.A.2: CT ELDS M.60.13, M.60.14 K.G.B.6: CT ELDS M.60.15 Early Learning & Development Standards	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources
RESOURCES			

Kendall Hunt
Blackline masters and materials from Teacher Resource Pack
Picture books, counters, 5-frames, collections of objects, colored pencils or crayons, counting mats, bags, play dough or modeling clay, straws, clipboards, string, pattern blocks, construction paper, glue, cardstock, paint, paper plates, paper

UNIT 4: UNDERSTANDING ADDITION AND SUBTRACTION

Illustrative Mathematics Unit Focus: Students relate counting to addition and solve addition and subtraction story problems within 10.

Essential Questions:
What does addition mean?
What does subtraction mean?

Unit Pacing: 26 Days (19 required lessons, 2 assessment, 5 flex days)

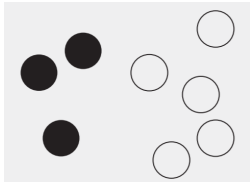
UNWRAPPED STANDARDS

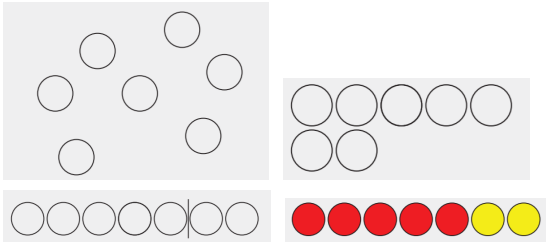
Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
K.CC.A.1 Count to 100 by ones and by tens.	Several progressions originate in knowing number names and the count sequence. Students usually know or can learn to say the counting words up to a given number before they can use these numbers to count objects or to tell the number of objects. Students become fluent in saying the count sequence so that they have enough attention to focus on the pairings involved in counting objects.	Counting tells how many there are in a set, no matter which order the objects are counted. When counting by ones, the next number in the sequence increases the quantity by one.	Count Number Number words 0 - 20 Numeral Ones Tens Forward
K.CC.A.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	Being able to count forward, beginning from a given number within the known sequence, is a prerequisite for the more advanced counting-on methods in Grade 1, in which a counting word represents a group of objects that are added or subtracted and addends become embedded within the total.	Counting tells how many there are in a set, no matter which order the objects are counted. The last number said when counting a set tells the total number of objects counted.	
K.CC.A.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).	Due to varied development of fine motor and visual development,reversal of numerals is anticipated. While reversals should be pointed out to students and correct formation modeled in instruction, the emphasis of this standard is on the use of numerals to represent quantities rather than the correct handwriting formation of	Numerals are the symbols we read and write to communicate quantities (numbers)	

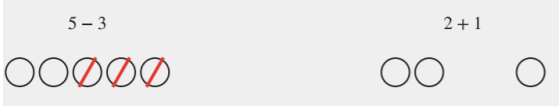
	the actual numeral itself. While kindergarteners may experiment with writing numbers beyond 20, this standard places emphasis on numbers 0-20. First graders will extend the counting sequence, number recognition and writing to 120.		
K.CC.B.4.c Understand that each successive number name refers to a quantity that is one larger.	Understanding that each successive number name refers to a quantity that is one larger is the conceptual start for Grade 1 counting on. Prior to reaching this understanding, a student might have to recount entirely a collection of known cardinality to which a single object has been added.	Numerals are the symbols we read and write to communicate quantities (numbers). The quantity of a set does not change based on the arrangement, size, or type of object (conservation).	
K.CC.B.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.	Counting objects arranged in a line is easiest; with more practice, students learn to count objects in more difficult arrangements, such as rectangular arrays (they need to ensure they reach every row or column and do not repeat rows or columns); circles (they need to stop just before the object they started with); and scattered configurations (they need to make a single path through all of the objects). Later, students can count out a given number of objects, which is more difficult than just counting that many objects, because counting must be fluent enough for the student to have enough attention to remember the number of objects that is being counted out.	Counting tells how many there are in a set, no matter which order the objects are counted. The last number said when counting a set tells the total number of objects counted.	
K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	Students act out adding and subtracting situations by representing quantities in the situation with objects, their fingers, and math drawings. To do this, students must mathematize a real-world situation, focusing on the quantities and their relationships rather than non-mathematical aspects of the situation. Situations can be acted out and/or presented with pictures or words. Math drawings facilitate reflection and discussion because they remain after the problem is solved. These concrete methods that show all of the	Addition means adding to or putting together parts to find the total or sum. Subtraction involves taking from or taking apart a given amount to find the difference.	Add Subtract Putting together Adding to Taking apart Taking from Plus In all Join Are left Minus

	objects are called Level 1 methods. Students learn and use mathematical and non-mathematical language, especially when they make up problems and explain their representation and solution. The teacher can write expressions (e.g., 3-1) to represent operations, as well as writing equations that represent the whole situation before the solution (e.g., 3 - 1=?) or after (e.g., 3 - 1= 2). Expressions like 3- 1 or 2+ 1 show the operation, and it is helpful for students to have experience just with the expression so they can conceptually chunk this part of an equation.		
K.OA.A.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	Students in Kindergarten work with the following types of addition and subtraction situations: Add To with Result Unknown; Take From with Result Unknown; and Put Together/Take Apart with Total Unknown and Both Addends Unknown (see the dark shaded types in Table 2). Add To/Take From situations are action-oriented; they show changes from an initial state to a final state. These situations are readily modeled by equations because each aspect of the situation has a representation as number, operation (or), or equal sign (, here with the meaning of “becomes,” rather than the more general “equals”).		

UNIT 4: UNDERSTANDING ADDITION AND SUBTRACTION				
What does addition mean? What does subtraction mean?				
CCSS Standards #	**Learning Targets**	**Summative Assessment Strategy**	**Lesson Progression and Connection to Math Practices**	**Common Learning Experiences and Assessments**
Section A: Count to Add and Subtract				

<table>
<tr>
<td>K.CC.A.1
K.CC.B.5
K.OA.A.1</td>
<td>I can model addition and subtraction in many ways.</td>
<td rowspan="2">
<table>
<tr><td>X</td><td>Selected Response</td></tr>
<tr><td>X</td><td>Constructed Response</td></tr>
<tr><td></td><td>Performance</td></tr>
<tr><td>X</td><td>Observation</td></tr>
</table>
</td>
<td>Lesson Progression:
Students learn to see adding as putting together two groups and counting the total number of objects, and subtracting as taking away a number of objects from a group and counting what remains. They represent combining and removing with physical objects. No stories or contexts are used here so that students can focus on the actions of putting together, adding to, and taking from. The language “add,” “put together,” “subtract,” and “take away” is used throughout the section to describe addition and subtraction. Students learn to interpret a phrase such as “5 and 3” to mean combining two groups (5 in one group and 3 in the other) and a phrase such as “5 take away 3” to mean finding what remains after removing 3 objects from a group of 5. They also hear language that describes the result of those actions, such as: “5 and 3 is 8” and “5 take away 3 is 2.” No symbolic notation is used at this point. Students also encounter and count groups of images in scattered configurations for the first time. This task highlights the need to keep track of what has been counted.
 
To keep track of the dots in this example, students may count all the black dots first and then the white dots or cross off dots as they count. They may also count in no particular order. Students see that although they may count the dots in a different order, they arrive at the same total.</td>
<td>Mandatory Lessons/Activities:
iM Lessons 1, 2, 3, 4, 5</td>
</tr>
<tr>
<td>Pacing:</td>
<td>5 days</td>
<td>Math Practices:
SMP: 1, 2, 3, 4, 5, 6, 7, 8</td>
<td>Assessments:
Cool-down 3
Checkpoint A</td>
</tr>
</table>

Section B: Representing and Solving Story Problems				
K.CC.A.1 K.CC.A.3 K.CC.B.5 K.OA.A.1 K.OA.A.2	I can represent and solve addition and subtraction problems.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students represent and solve story problems with playgrounds and parks as contexts. The types of problems are limited to Add To, Result Unknown and Take From, Result Unknown. Students begin by acting out and representing stories that don't include a question. Questionless story problems encourage students to think about the context and the action in the story without feeling pressure to solve the problem. There were 5 students jumping rope at recess. 2 more students came out to play with them. As questions are posed, students represent the problems with objects, math tools, drawings and numbers, and focus on explaining how their representation connects to the story. While they may represent a problem in any way that makes sense to them, students notice that organized drawings or objects make it easier to see the connections.  Students are also introduced to the concept of 0 representing a count of no objects. This idea may be abstract to students, so it is introduced in a Take From, Result Unknown story problem, where taking objects away leaves no remaining objects. The term "expression" is introduced here. Students begin to see expressions as a way to record quantities being combined or removed. For instance, as a student describes what happens with their counters, the teacher writes the words "7 take away 3" and "7 - 3 ," and says "7 take away 3" and "7 minus 3." Students are not expected to interpret expressions at this time.	**Mandatory Lessons/Activities:** iM Lessons 6,7, 8, 9, 10, 11, 12,

<table>
<tr><td>Pacing:</td><td>7 days</td><td></td><td>Math Practices:
SMP: 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Cool-down 11
Checkpoint B</td></tr>
<tr><td colspan="5">Section C: Addition and Subtraction Expressions</td></tr>
<tr><td>K.CC.A.1
K.CC.A.2
K.CC.A.3
K.CC.B.4.c
K.OA.A.1
K.OA.A.2</td><td>I can represent and solve addition and subtraction problems.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
In this section, students formally work with expressions for the first time. They match expressions such as 3+2 and 8 - 1 to story problems and drawings and articulate why an expression represents a given problem or drawing. While students fill in addition and subtraction expressions, they are not expected to produce expressions independently in this section.
 
Students then transition from expressions that represent story problems or drawings to expressions without a context. To find the value of expressions, students may add or subtract in a way that makes sense to them, reasoning with fingers, objects, or drawings. With repeated experience, students begin to notice regularity when adding and subtracting (MP8). For instance, they see that adding 1 results in the next number in the count sequence and that adding 0 results in the same number.
  </td><td>Mandatory Lessons/Activities:
iM Lessons 14, 15, 16, 17,</td></tr>
<tr><td>Pacing:</td><td>4 days</td><td></td><td>Math Practices:
SMP: 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Cool-down 16
Checkpoint C</td></tr>
</table>

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Students may count all objects when joining groups instead of knowing the amount of one group and counting on the amount of the second group to find the total. Students may incorrectly think that subtraction is commutative, i.e. 8-5=5-8.	K.CC.A.1: CT ELDS M.60.1 K.CC.A.2: CT ELDS M.60.1 K.CC.A.3: CT ELDS M.60.4 K.CC.B.4: CT ELDS M.60.2, M.60.3, M.60.5 K.CC.B.5: CT ELDS M.60.2, M.60.3 K.OA.A.1: CT ELDS M.60.7, M.60.8 K.OA.A.2: CT ELDS M.60.7, M.60.8 Early Learning & Development Standards	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources
RESOURCES			
Kendall Hunt Blackline masters and materials from Teacher Resource Pack Connecting Cubes, pattern blocks, 5-frames, counters, two-color counters, crayons, markers			

UNIT 5: COMPOSING AND DECOMPOSING NUMBERS TO 10

Illustrative Mathematics Unit Focus: Students compose and decompose numbers within 10.

Essential Questions:
How can we represent a given number?
What does addition mean?
What does subtraction mean?

Unit Pacing: 31 days (15 required lessons, 16 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
K.CC.A.1 Count to 100 by ones and by tens.	Several progressions originate in knowing number names and the count sequence. Students usually know or can learn to say the counting words up to a given number before they can use these numbers to count objects or to tell the number of objects. Students become fluent in saying the count sequence so that they have enough attention to focus on the pairings involved in counting objects.	Counting tells how many there are in a set, no matter which order the objects are counted. When counting by ones, the next number in the sequence increases the quantity by one.	Count Number Number words 0 - 20 Numeral Ones Tens Forward
K.CC.A.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	Being able to count forward, beginning from a given number within the known sequence, is a prerequisite for the more advanced counting-on methods in Grade 1, in which a counting word represents a group of objects that are added or subtracted and addends become embedded within the total.	Counting tells how many there are in a set, no matter which order the objects are counted. The last number said when counting a set tells the total number of objects counted.	
K.CC.B.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a	Counting objects arranged in a line is easiest; with more practice, students learn to count objects in	Counting tells how many there are in a set, no matter which order the objects	

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.	more difficult arrangements, such as rectangular arrays (they need to ensure they reach every row or column and do not repeat rows or columns); circles (they need to stop just before the object they started with); and scattered configurations (they need to make a single path through all of the objects). Later, students can count out a given number of objects, which is more difficult than just counting that many objects, because counting must be fluent enough for the student to have enough attention to remember the number of objects that is being counted out.	are counted. The last number said when counting a set tells the total number of objects counted.	
K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	Students act out adding and subtracting situations by representing quantities in the situation with objects, their fingers, and math drawings. To do this, students must model a real-world situation, focusing on the quantities and their relationships rather than non-mathematical aspects of the situation. Situations can be acted out and/or presented with pictures or words. Math drawings facilitate reflection and discussion because they remain after the problem is solved. These concrete methods that show all of the objects are called Level 1 methods. Students learn and use mathematical and non-mathematical language, especially when they make up problems and explain their representation and solution. The teacher can write expressions (e.g., 3-1) to represent operations, as well as writing equations that represent the whole situation before the solution (e.g., 3 - 1=?) or after (e.g., 3 - 1= 2). Expressions like 3- 1 or 2+ 1 show the operation, and it is helpful for students to have experience just with the expression so they can conceptually chunk this part of an equation	Addition means adding to or putting together parts to find the total or sum. Subtraction involves taking from or taking apart a given amount to find the difference.	Add Subtract Putting together Adding to Taking apart Taking from Plus In all Join Are left Minus Decompose Break apart
K.OA.A.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by	Students in Kindergarten work with the following types of addition and subtraction situations: Add	Addition means adding to or putting together parts to find the total or sum.	

using objects or drawings to represent the problem.	To with Result Unknown; Take From with Result Unknown; and Put Together/Take Apart with Total Unknown and Both Addends Unknown (see the dark shaded types in Table 2). Add To/Take From situations are action-oriented; they show changes from an initial state to a final state. These situations are readily modeled by equations because each aspect of the situation has a representation as number, operation (or), or equal sign (, here with the meaning of "becomes," rather than the more general "equals").	Subtraction involves taking from or taking apart a given amount to find the difference.	
K.OA.A.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).	Put Together/Take Apart situations with Both Addends Unknown play an important role in Kindergarten because they allow students to explore various compositions that make each number. This will help students to build the Level 2 embedded number representations used to solve more advanced problem subtypes.	A given number can be represented by putting together parts of the number or breaking apart the number in different ways.	
K.OA.A.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.	In Kindergarten, teachers help children lay the foundation for understanding the base-ten system by drawing special attention to 10. They decompose 10 into pairs such as 1+ 9, 2+ 8, 3+ 7 and find the number that makes 10 when added to a given number such as 3.	A given number can be represented by putting together parts of the number or breaking apart the number in different ways.	
K.OA.A.5 Fluently add and subtract within 5.	Experience with decompositions of numbers and with Add To and Take From situations enables students to begin to fluently add and subtract within 5.	Addition means adding to or putting together parts to find the total or sum. 3. Subtraction involves taking from or taking apart a given amount to find the difference.	

UNIT 5: COMPOSING AND DECOMPOSING NUMBERS TO 10

How can we represent a given number?
What does addition mean?
What does subtraction mean?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Make and Break Apart Numbers to 9				
K.CC.A.1 K.CC.A.2 K.OA.A.2 K.OA.A.3 K.OA.A.5	I can make and break apart numbers in more than one way and record my thinking.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students compose and decompose numbers to 9. They work with physical objects, such as counters and connecting cubes, that can help to show ways to make and break apart numbers. As they progress through the lessons, students come to understand that there are different ways to compose and decompose a given number. They write expressions to record compositions and decompositions.	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3, 4
Pacing:	4 days		**Math Practices:** SMP: 3, 5, 6, 7, 8	**Assessments:** Cool-down 3 Checkpoint A
Section B: More Types of Story Problems				
K.CC.A.1 K.CC.A.2 K.OA.A.1 K.OA.A.2 K.OA.A.3	I can represent and solve addition and subtraction problems.	X Selected Response X Constructed Response Performance	**Lesson Progression:** Students represent and solve Put Together/Take Apart story problems—first where the total is unknown, and later where both addends are unknown. Students also see equations and learn the term for the first time. *Jada made 6 paletas with her brother.* *They made two flavors, lime and coconut.*	**Mandatory Lessons/Activities:** iM Lessons 5, 6, 7, 8, 9,

		X Observation	*How many of the paletas were lime?* *Then how many of the paletas were coconut?* Problems where both addends are unknown may be more challenging because there is no action in the story and more than one solution is possible. Students work to find multiple solutions but are not expected to find all the solutions in kindergarten. To represent and solve story problems, students continue to use math tools and drawings, and to explain how their representation shows the story. They may use methods such as clearly separating the groups, using 2 colors, or using letter, word, and number labels to make their drawings easier for others to understand. Students also write expressions independently to record the solutions to the story problems. Equations are introduced as a way to record the quantities and solutions in story problems. For instance, as a student explains a solution to the paleta problem, the teacher writes "6=2+4" and says: "Jada made 6 paletas, 2 in coconut flavor and 4 in lime flavor. We can write that as 6 is 2 plus 4." All equations in this unit are written with the total first (on the left side of the equal sign). Equations are read as "6 is 2 plus 4," rather than "6 equals 2 plus 4." Note that students are not expected to interpret equations at this time.	
Pacing:	7 days		**Math Practices:** SMP: 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Cool-down 8 Checkpoint B
Section C: Make and Break Apart 10				
K.CC.A.3 K.CC.B.5 K.OA.A.1 K.OA.A.2 K.OA.A.3	I can make and break apart numbers in more than one way and record my thinking.	X Selected Response X Constructed	**Lesson Progression:** This section focuses exclusively on composing and decomposing 10. This number is foundational to the understanding of place value and the work on numbers and operations in later grades.	**Mandatory Lessons/Activities:** iM Lessons 10, 11, 12, 13, 14, 15

K.OA.A.4			Previously, students developed their understanding of the numbers 6–9 by relating it to 5 and using 5-frames. Here, students use a 10-frame—by putting together two 5-frames—and their fingers as tools to represent numbers and make and break apart 10 in different ways. The blank squares in the 10-frame and the fingers that are down allow students to see or count how many more are needed to make 10. Throughout the section, students continue to build their familiarity with equations. They connect compositions and decompositions of 10 represented on their fingers and on 10-frames to addition equations and write missing numbers in such equations. Students are not expected to write equations independently in kindergarten. And although students may start to learn combinations that make 10 from memory, fluency with sums of 10 is not required until grade 1.	
Pacing:	6 days		**Math Practices:** SMP: 3, 5, 6, 7, 8	**Assessments:** Cool-down 13 Checkpoint C

	Response
	Performance
X	Observation

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Students often think there is only one way to break a number down into parts.	K.CC.A.1: CT ELDS M.60.1 K.CC.A.2: CT ELDS M.60.1 K.CC.B.5: CT ELDS M.60.2, M.60.3 K.OA.A.1: CT ELDS M.60.7, M.60.8 K.OA.A.2: CT ELDS M.60.7, M.60.8 K.OA.A.3: CT ELDS M.60.7, M.60.8	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources

	K.OA.A.4: CT ELDS M.60.7, M.60.8 K.OA.A.5: CT ELDS M.60.7, M.60.8 Early Learning & Development Standards		
RESOURCES			
Kendall Hunt Blackline masters and materials from Teacher Resource Pack Connecting cubes, number cards 0-10, crayons, pattern blocks, two-color counters, glue, scissors, cups, 10-frames			

UNIT 6: NUMBERS 0-20

Illustrative Mathematics Unit Focus: Students answer "how many" questions and count out groups within 20. They understand that numbers 11 to 19 are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. They write numbers within 20.

Essential Questions:
How can we represent a given number?

Unit Pacing: 24 days (11 required lessons, 11 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
K.CC.A.1 Count to 100 by ones and by tens.	Several progressions originate in knowing number names and the count sequence. Students usually know or can learn to say the counting words up to a given number before they can use these numbers to count objects or to tell the number of objects. Students become fluent in saying the count sequence so that they have enough attention to focus on the pairings involved in counting objects.	Counting tells how many there are in a set, no matter which order the objects are counted. When counting by ones, the next number in the sequence increases the quantity by one.	Count Number Number words 0 - 20 Numeral Ones
K.CC.A.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	Being able to count forward, beginning from a given number within the known sequence, is a prerequisite for the more advanced counting-on methods in Grade 1, in which a counting word represents a group of objects that are added or subtracted and addends become embedded within the total.	Counting tells how many there are in a set, no matter which order the objects are counted. The last number said when counting a set tells the total number of objects counted.	
K.CC.A.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).	Due to varied development of fine motor and visual development,reversal of numerals is anticipated. While reversals should be pointed out to students and correct formation modeled in instruction,	Numerals are the symbols we read and write to communicate quantities (numbers)	

	the emphasis of this standard is on the use of numerals to represent quantities rather than the correct handwriting formation of the actual numeral itself. While kindergarteners may experiment with writing numbers beyond 20, this standard places emphasis on numbers 0-20. First graders will extend the counting sequence, number recognition and writing to 120.		
K.CC.B.4 Understand the relationship between numbers and quantities; connect counting to cardinality.	Experience with counting allows students to discuss and come to understand the second part of K.CC.4b—that the number of objects is the same regardless of their arrangement or the order in which they were counted.	The last number said when counting a set tells the total number of objects counted. Numerals are the symbols we read and write to communicate quantities (numbers). The quantity of a set does not change based on the arrangement, size, or type of object (conservation).	
K.CC.B.4.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.	To count a group of objects, they pair each word said with one object. This is usually facilitated by an indicating act (such as pointing to objects or moving them) that keeps ea ch word said in time paired to one and only one object located in space.		
K.CC.B.4.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.	Students understand that the last number name said in counting tells the number of objects counted. Prior to reaching this understanding, a student who is asked "How many kittens?" may regard the counting performance itself as the answer, instead of answering with the cardinality of the set. Experience with counting allows students to discuss and come to understand the second part of K.CC.4b—that the number of objects is the same regardless of their arrangement or the order in which they were counted. This connection will continue in Grade 1 with the more advanced counting-on methods in which a counting word represents a group of		

	objects that are added or subtracted and addends become embedded within the total.		
K.CC.B.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.	Counting objects arranged in a line is easiest; with more practice, students learn to count objects in more difficult arrangements, such as rectangular arrays (they need to ensure they reach every row or column and do not repeat rows or columns); circles (they need to stop just before the object they started with); and scattered configurations (they need to make a single path through all of the objects). Later, students can count out a given number of objects, which is more difficult than just counting that many objects, because counting must be fluent enough for the student to have enough attention to remember the number of objects that is being counted out.	Counting tells how many there are in a set, no matter which order the objects are counted. The last number said when counting a set tells the total number of objects counted.	
K.NBT.A.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 (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	In Kindergarten, teachers help children lay the foundation for understanding the base-ten system by drawing special attention to 10. Children learn to view the whole numbers 11 through 19 as ten ones and some more ones. Children can count out a given teen number of objects, e.g., 12, and group the objects to see the ten ones and the two ones. The numerals 11, 12, 13, ..., 19 need special attention for children to understand them. The first nine numerals 1, 2, 3, ..., 9, and 0 are essentially arbitrary marks. These same marks are used again to represent larger numbers. Children need to learn the differences in the ways these marks are used. For example, initially, a numeral such as 16 looks like "one, six," not "1 ten and 6 ones." Layered place value cards can help children see the 0 "hiding" under the ones	A given number can be represented by putting together parts of the number or breaking apart the number in different ways. A group of ten consists of ten "ones". Teen numbers are composed of a group of ten ones and some more ones.	Number words 10-19 Compose Decompose Equation Ones Teen number

	place and that the 1 in the tens place really is 10 (ten ones).		
K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	Students act out adding and subtracting situations by representing quantities in the situation with objects, their fingers, and math drawings. To do this, students must model a real-world situation, focusing on the quantities and their relationships rather than non-mathematical aspects of the situation. Situations can be acted out and/or presented with pictures or words. Math drawings facilitate reflection and discussion because they remain after the problem is solved. These concrete methods that show all of the objects are called Level 1 methods. Students learn and use mathematical and non-mathematical language, especially when they make up problems and explain their representation and solution. The teacher can write expressions (e.g., 3-1) to represent operations, as well as writing equations that represent the whole situation before the solution (e.g., 3 - 1=?) or after (e.g., 3 - 1= 2). Expressions like 3-1 or 2+ 1 show the operation, and it is helpful for students to have experience just with the expression so they can conceptually chunk this part of an equation	Addition means adding to or putting together parts to find the total or sum. Subtraction involves taking from or taking apart a given amount to find the difference.	Add Subtract Putting together Adding to Taking apart Taking from Plus In all Altogether Join Minus Decompose Break apart
K.OA.A.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	Students in Kindergarten work with the following types of addition and subtraction situations: Add To with Result Unknown; Take From with Result Unknown; and Put Together/Take Apart with Total Unknown and Both Addends Unknown (see the dark shaded types in Table 2). Add To/Take From situations are action-oriented; they show changes from an initial state to a final state.	Addition means adding to or putting together parts to find the total or sum. Subtraction involves taking from or taking apart a given amount to find the difference.	

	These situations are readily modeled by equations because each aspect of the situation has a representation as number, operation (or), or equal sign (, here with the meaning of “becomes,” rather than the more general “equals”).		
K.OA.A.5 Fluently add and subtract within 5.	Experience with decompositions of numbers and with Add To and Take From situations enables students to begin to fluently add and subtract within 5.		

UNIT 6: NUMBERS 0-20				
How can we represent a given number?				
CCSS Standards #	**Learning Targets**	**Summative Assessment Strategy**	**Lesson Progression and Connection to Math Practices**	**Common Learning Experiences and Assessments**
Section A: Count Groups of 11-20 Objects				
K.CC.A.1 K.CC.A.2 K.CC.A.3 K.CC.B.4 K.CC.B.4.a K.CC.B.4.b K.CC.B.5 K.OA.A.1 K.OA.A.2 K.OA.A.5	I can count to tell how many.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** In this section, students count groups of 11–20 objects using strategies they developed earlier when working with smaller sets of objects. Students participate in Counting Collections as the first activity in each lesson. They think about how organizing the objects can help ensure an accurate count and may use a counting mat or a 10-frame. Students also recognize that the number of objects in a group does not change, regardless of the way they are arranged. Display written numbers for students whenever they share their count. In later sections, after seeing numbers displayed repeatedly, students will practice recognizing, tracing, and writing numbers 11–20. They will relate these numbers to addition expressions and equations. No expressions or	**Mandatory Lessons/Activities:** iM Lessons 1, 3, 4,

<table>
<tr><td></td><td></td><td rowspan="3"></td><td>equations are used in this section.</td><td></td></tr>
<tr><td>Pacing:</td><td>3 days</td><td>Math Practices:
SMP: 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Checkpoint A</td></tr>
<tr><td colspan="5">Section B: 10 Ones and Some More</td></tr>
<tr><td>K.CC.A.3
K.CC.B.4.a
K.CC.B.5
K.NBT.A.1
K.OA.A.1</td><td>I can compose and decompose numbers and record my thinking.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students see the numbers 11–19 as 10 ones and some more ones. They compose and decompose teen numbers and record the compositions and decompositions with objects, drawings, and expressions.

Students use fingers and 10-frames to represent these numbers, but with more emphasis on the 10-frames as the lessons progress. To represent a teen number, they fill a 10-frame and show some more ones, which they may arrange in different ways. To determine the number of objects, students may count all or count on from 10 (though the latter is not an expectation in kindergarten).

Students compose and decompose teen numbers by starting with the parts (“10 and 5 is 15”) and starting with the total (“15 is 10 and 5”). For the first time, students see equations with the addends on the left side of the equal sign (10+5=15). They complete equations that show missing parts or a missing total to represent teen numbers as 10 ones and some more ones (_+_=12 and 10+7=_).

Starting from this section, students have access to a reference sheet that shows numbers 11–20 with dots in 10-frames, which they can use to identify written numbers. Students can count the dots to determine which written number is on the card.</td><td>Mandatory Lessons/Activities:
iM Lessons : 5, 6, 7, 8, 9, 10</td></tr>
<tr><td>Pacing:</td><td>6 days</td><td>Math Practices:
SMP: 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Cool-downs 5 and 8</td></tr>
</table>

				Checkpoint B
Section C: Count Groups of 11-20 images				
K.CC.A.1 K.CC.A.2 K.CC.A.3 K.CC.B.4 K.CC.B.4.a K.CC.B.4.b K.CC.B.5 K.NBT.A.1 K.OA.A.1 K.OA.A.4	I can count to tell how many.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students count groups of up to 20 images arranged in lines, arrays, circles, and on 10-frames. Images arranged in a circle can be tricky to count, motivating a greater need to keep track of what has been counted. Students use their understanding that teen numbers are composed of 10 ones and some ones to help them count and keep track of groups of up to 20 images and then to write numbers to represent such quantities. Throughout this section, students should have continued access to the reference sheet that shows numbers 11–20 with dots in 10-frames.	**Mandatory Lessons/Activities:** iM Lessons: 11, 12
Pacing:	2 days		**Math Practices:** SMP: 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Cool-down 12 Checkpoint C

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Students may reverse the order of the digits for teen numbers writing 81 instead of 18.	K.CC.A.1: CT ELDS M.60.1 K.CC.A.2: CT ELDS M.60.1 K.CC.A.3: CT ELDS M.60.4 K.CC.B.4: CT ELDS M.60.2, M.60.3, M.60.5 K.CC.B.5: CT ELDS M.60.2, M.60.3 K.OA.A.1: CT ELDS M.60.7, M.60.8 K.OA.A.2: CT ELDS M.60.7, M.60.8 K.OA.A.5: CT ELDS M.60.7, M.60.8 K.NBT.A.1: CT ELDS M.60.7, M.60.8	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources

	Early Learning & Development Standards		

RESOURCES
Kendall Hunt Blackline masters and materials from Teacher Resource Pack 10-frames, collection of objects, crayons, colored pencils, markers, connecting cubes, counting mats, 5-frames, number cards 0-10, pattern blocks, glue or tape, scissors, two-color counters

UNIT 7: SOLID SHAPES ALL AROUND US

Illustrative Mathematics Unit Focus: Students identify, describe, analyze, compare, and compose two- and three-dimensional shapes. Counting, addition, and subtraction are revisited in the geometric contexts.

Essential Questions:
How do we describe objects in our world?
How can we name, describe, and analyze two- and three-dimensional shapes?
How can we create new shapes using existing shapes?
What can be measured?
Why do we measure?

Unit Pacing: 21 days (16 required lessons, 3 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
K.CC.A.1 Count to 100 by ones and by tens.	Several progressions originate in knowing number names and the count sequence. Students usually know or can learn to say the counting words up to a given number before they can use these numbers to count objects or to tell the number of objects. Students become fluent in saying the count sequence so that they have enough attention to focus on the pairings involved in counting objects.	Counting tells how many there are in a set, no matter which order the objects are counted. When counting by ones, the next number in the sequence increases the quantity by one.	Count Number Number words 0 - 20 Ones Tens
K.CC.A.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).	Due to varied development of fine motor and visual development,reversal of numerals is anticipated. While reversals should be pointed out to students and correct formation modeled in instruction, the emphasis of this standard is on the use of numerals to represent quantities rather than the correct handwriting formation of	Numerals are the symbols we read and write to communicate quantities (numbers)	Count Number Numeral Number words 0 - 20 How many Show Explain

	the actual numeral itself. While kindergarteners may experiment with writing numbers beyond 20, this standard places emphasis on numbers 0-20. First graders will extend the counting sequence, number recognition and writing to 120.		Represent
K.CC.B.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.	Counting objects arranged in a line is easiest; with more practice, students learn to count objects in more difficult arrangements, such as rectangular arrays (they need to ensure they reach every row or column and do not repeat rows or columns); circles (they need to stop just before the object they started with); and scattered configurations (they need to make a single path through all of the objects). Later, students can count out a given number of objects, which is more difficult than just counting that many objects, because counting must be fluent enough for the student to have enough attention to remember the number of objects that is being counted out.	Counting tells how many there are in a set, no matter which order the objects are counted. The last number said when counting a set tells the total number of objects counted.	Count Number Number words 0 - 20
K.CC.C.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.	Students first learn to match the objects in the two groups to see if there are any extra and then to count the objects in each group. Students learn that even if one group looks as if it has more objects (e.g., has some extra sticking out), matching or counting may reveal a different result.	One quantity is either greater than, less than or equal to the other.	Compare Equal to Same as Greater than More than Less than Fewer than
K.CC.C.7 Compare two numbers between 1 and 10 presented as written numerals.	Students use their knowledge of the count sequence to decide which number is greater than the other (the number farther along in the count sequence). Comparing numbers progresses in Grade 1 to adding and subtracting in comparing situations (finding out "how many more" or "how many less"and not just "which is more" or "which is less").		
K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	Students act out adding and subtracting situations by representing quantities in the situation with objects, their fingers, and math drawings. To do this, students must mathematize a real-world	Addition means adding to or putting together parts to find the total or sum.	Add Subtract Putting together Adding to

	situation, focusing on the quantities and their relationships rather than non-mathematical aspects of the situation. Situations can be acted out and/or presented with pictures or words. Math drawings facilitate reflection and discussion because they remain after the problem is solved. These concrete methods that show all of the objects are called Level 1 methods. Students learn and use mathematical and non-mathematical language, especially when they make up problems and explain their representation and solution. The teacher can write expressions (e.g., 3-1) to represent operations, as well as writing equations that represent the whole situation before the solution (e.g., 3 - 1=?) or after (e.g., 3 - 1= 2). Expressions like 3- 1 or 2+ 1 show the operation, and it is helpful for students to have experience just with the expression so they can conceptually chunk this part of an equation.	Subtraction involves taking from or taking apart a given amount to find the difference.	Taking apart Taking from Plus In all Join Are left Minus
K.OA.A.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	Students in Kindergarten work with the following types of addition and subtraction situations: Add To with Result Unknown; Take From with Result Unknown; and Put Together/Take Apart with Total Unknown and Both Addends Unknown (see the dark shaded types in Table 2). Add To/Take From situations are action-oriented; they show changes from an initial state to a final state. These situations are readily modeled by equations because each aspect of the situation has a representation as number, operation (or), or equal sign (, here with the meaning of “becomes,” rather than the more general “equals”).		
K.OA.A.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).	Put Together/Take Apart situations with Both Addends Unknown play an important role in Kindergarten because they allow students to explore various compositions that make each number. This will help students to build the Level 2 embedded number representations used to solve more advanced problem subtypes.	A given number can be represented by putting together parts of the number or breaking apart the number in different ways.	

K.OA.A.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.	In Kindergarten, teachers help children lay the foundation for understanding the base-ten system by drawing special attention to 10. They decompose 10 into pairs such as 1+ 9, 2+ 8, 3+ 7 and find the number that makes 10 when added to a given number such as 3.	A given number can be represented by putting together parts of the number or breaking apart the number in different ways.	
K.OA.A.5 Fluently add and subtract within 5.	Experience with decompositions of numbers and with Add To and Take From situations enables students to begin to fluently add and subtract within 5.	Addition means adding to or putting together parts to find the total or sum. 3. Subtraction involves taking from or taking apart a given amount to find the difference.	
K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	Students often initially hold undifferentiated views of measurable attributes, saying that one object is "bigger" than another whether it is longer, or greater in area, or greater in volume, and so forth. For example, two students might both claim their block building is "the biggest." Conversations about how they are comparing—one building may be taller (greater in length) and another may have a larger base (greater in area)—help students learn to discriminate and name these measurable attributes. As they discuss these situations and compare objects using different attributes, they learn to distinguish, label, and describe several measurable attributes of a single object.	Different attributes can be measured, such as length or weight. We measure to determine the amount of a measurable attribute for a given object.	Heavier Lighter Weight Capacity Hold more Hold less
K.MD.A.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. For example, directly compare the heights of two children and describe one child as taller/shorter.	Kindergartners easily directly compare lengths in simple situations, such as comparing people's heights, because standing next to each other automatically aligns one endpoint. However, in other situations they may initially compare only one endpoint of objects to say which is longer. Discussing such situations (e.g., when a child claims that he is "tallest" because he is standing on a chair) can help students resolve and coordinate perceptual and conceptual information when it conflicts.		

K.MD.B.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.	Students in Kindergarten classify objects into categories, initially specified by the teacher and perhaps eventually elicited from students. For example, in a science context, the teacher might ask students in the class to sort pictures of various organisms into two piles: organisms with wings and those without wings. Students can then count the number of specimens in each pile. Students can use these category counts and their understanding of cardinality to say whether there are more specimens with wings or without wings.	We sort and classify objects to organize them in groups by common attributes to see relationships among the groups.	Alike Different Shape Size Sort Count
K.G.A.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.	Students refine their informal language by learning mathematical concepts and vocabulary so as to increasingly describe their physical world from geometric perspectives, e.g., shape, orientation, spatial relations (MP4). They increase their knowledge of a variety of shapes, including circles, triangles, squares, rectangles, and special cases of other shapes such as regular hexagons, and trapezoids with unequal bases and non-parallel sides of equal length. Students also begin to name and describe three-dimensional shapes with mathematical vocabulary, such as “sphere,” “cube,” “cylinder,”and “cone.” Finally, in the domain of spatial reasoning, students discuss not only shape and orientation, but also the relative positions of objects, using terms such as “above,” “below,” “next to,” “behind,” “in front of,” and “beside.”	We can describe objects in our world using geometric ideas, such as names of shapes and positional words.	Above Below In front of Behind Beside Next to Flat shapes Square Circle Triangle Rectangle Hexagon Solid shapes Cube Cone Cylinder Sphere Pyramid Point Roll Corners
K.G.A.2 Correctly name shapes regardless of their orientations or overall size.	Students learn to name shapes such as circles, triangles, and squares, whose names occur in everyday language, and distinguish them from nonexamples of these categories, often based initially on visual prototypes.	Naming shapes is not dependent on their position, orientation or size.	
K.G.A.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").	In the domain of shape, students learn to match two-dimensional shapes even when the shapes have different orientations. The need to explain their decisions about shape names or	Two- and three-dimensional shapes can be named, described and analyzed using attributes, such as number and lengths of sides and number of angles/vertices.	

	classifications prompts students to attend to and describe certain features of the shapes. That is, concept images and names they have learned for the shapes are the raw material from which they can abstract common features. They identify faces of three-dimensional shapes as two-dimensional geometric figures and explicitly identify shapes as two-dimensional (“flat” or lying in a plane) or three-dimensional ("solid").		
K.G.B.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).	The need to explain their decisions about shape names or classifications prompts students to attend to and describe certain features of the shapes. That is, concept images and names they have learned for the shapes are the raw material from which they can abstract common features.		
K.G.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	The need to explain their decisions about shape names or classifications prompts students to attend to and describe certain features of the shapes. That is, concept images and names they have learned for the shapes are the raw material from which they can abstract common features. This also supports their learning to represent shapes informally with drawings and by building them from components (e.g., manipulatives such as sticks). With repeated experiences such as these, students become more precise (MP6).		Round Circle Rectangle Side Square Straight Triangle Trapezoid Hexagon Sphere Cylinder Cube Cone Pyramid
K.G.B.6 Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"	A second important area for kindergartners is the composition of geometric figures. Students not only build shapes from components,but also compose shapes to build pictures and designs. Initially lacking competence in composing geometric shapes, they gain abilities to combine shapes–first by trial and error and gradually by considering components–into pictures. At first, side length is the only component considered. Later experience brings an intuitive appreciation of angle size. Students combine two-dimensional shapes and solve problems such as deciding	New shapes can be created by putting together existing shapes.	

	which piece will fit into a space in a puzzle, intuitively using geometric motions (slides, flips, and turns, the informal names for translations, reflections, and rotations, respectively). They can construct their own outline puzzles and exchange them, solving each other's.		

UNIT 7: SOLID SHAPES ALL AROUND US

How do we describe objects in our world?
How can we name, describe, and analyze three-dimensional shapes?
How can we create new shapes using existing shapes?
What can be measured?
Why do we measure?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Compose and Count with Flat Shapes				
K.CC.A.1 K.CC.A.3 K.CC.B.5 K.CC.C.6 K.CC.C.7 K.G.B.5 K.G.B.6 K.OA.A.1 K.OA.A.2 K.OA.A.3 K.OA.A.4 K.OA.A.5	I can put shapes together to form new shapes. I can represent and solve addition and subtraction problems.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** In this section, students strengthen their understanding of number concepts while working with pattern blocks. The work here allows the teacher to ensure that students have proficiency in counting and counting out to 20, writing and comparing numbers, and solving story problems. In solving story problems, students match equations to the quantities in the problems, and complete equations so that they match the problems. For the first time, they hear equations read with the term "equals" rather than "is." For example, 9 - 3 = 6 is read "9 minus 3 equals 6." In this section, students see equations written with both the total written first and the addends written first. Students consider ways to make the number 10 in	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3, 4, 5, 6

<table>
<tr><td></td><td></td><td rowspan="2"></td><td>the context of building shapes and completing puzzles with pattern blocks. Along the way, they think about attributes of pattern blocks.</td><td></td></tr>
<tr><td>Pacing:</td><td>6 days</td><td>Math Practices:
SMP: 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Checkpoint A</td></tr>
<tr><td colspan="5">Section B: Describe, Compare, and Create Solid Shapes</td></tr>
<tr><td>K.CC.A.1
K.CC.B.5
K.G.A.1
K.G.A.2
K.G.A.3
K.G.B.4
K.G.B.5
K.G.B.6
K.MD.A.1
K.MD.A.2
K.MD.B.3
K.OA.A.5</td><td>I can compare the weight and capacity of objects.

I can describe and compare three-dimensional shapes.

I can sort objects into categories.</td><td rowspan="2"><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
This section introduces students to solid shapes. Students begin by distinguishing solid shapes from flat shapes. They then learn about weight as an attribute of solid shapes and compare weights, and work with tactile materials or objects to develop their understanding of three-dimensional shapes.

Throughout the section, students hear and use the terms “flat” and “solid” to describe two- and three dimensional shapes, but they also use their own language to talk about shapes. When comparing weights, the terms “heavy,” “light,” “heavier,” and “lighter” are used. While students are introduced to the names of solid shapes, they are not expected to use the formal terms. For example, they may say “ball” to refer to a sphere.

Initially, students build solid shapes with clay. Later, they do so out of given components, using positional words and names of shapes as they build and describe their creations. They also describe attributes of solid shapes as they compare and sort them.

At the end of the section, students create a model of their classroom and use solid shapes to represent objects in their world.</td><td>Mandatory Lessons/Activities:
iM Lessons 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</td></tr>
<tr><td>Pacing:</td><td>10 days</td><td>Math Practices:
SMP: 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Cool-down 8
Checkpoint B</td></tr>
</table>

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Students may use two-dimensional vocabulary when describing three-dimensional shapes. For example, students may say a cube is a square or that a sphere is a circle. Students may think weight and capacity are associated with the size of an object.	K.CC.A.1: CT ELDS M.60.1 K.CC.A.3: CT ELDS M.60.4 K.CC.B.4: CT ELDS M.60.2, M.60.3, M.60.5 K.CC.B.5: CT ELDS M.60.2, M.60.3 K.CC.C.6: CT ELDS M.60.6 K.CC.C.7: CT ELDS M.60.6 K.OA.A.1: CT ELDS M.60.7, M.60.8 K.OA.A.2: CT ELDS M.60.7, M.60.8 K.OA.A.3: CT ELDS M.60.7, M.60.8 K.OA.A.4: CT ELDS M.60.7, M.60.8 K.OA.A.5: CT ELDS M.60.7, M.60.8 K.MD.A.2: CT ELDS M.60.9, M.60.10 K.MD.B.3: CT ELDS M.60.12 K.G.A.1: CT ELDS M.60.13, M.60.14 K.G.A.2: CT ELDS M.60.13, M.60.14 K.G.A.3: CT ELDS M.60.13, M.60.14 K.G.B.4: CT ELDS M.60.13, M.60.14 K.G.B.5: CT ELDS M.60.15 K.G.B.6: CT ELDS M.60.15 Early Learning & Development Standards	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources

RESOURCES
Kendall Hunt Blackline masters and materials from Teacher Resource Pack Pattern blocks, colored pencils, crayons, markers, 10-frames, connecting cubes, two-color counters, cups, clay, geoblocks, solid shapes, containers of different sizes, sticky notes, bags, sticks, folders