COMMON CORE State Standards

DECONSTRUCTED for CLASSROOM IMPACT

K

KINDERGARTEN

MATHEMATICS

The COMMON CORE Institute

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Introduction

The Common Core Institute is pleased to offer this grade-level tool for educators who are teaching with the Common Core State Standards.

The Common Core Standards Deconstructed for Classroom Impact is designed for educators by educators as a two-pronged resource and tool 1) to help educators increase their depth of understanding of the Common Core Standards and 2) to enable teachers to plan College & Career Ready curriculum and classroom instruction that promotes inquiry and higher levels of cognitive demand.

What we have done is not all new. This work is a purposeful and thoughtful compilation of preexisting materials in the public domain, state department of education websites, and original work by the Center for College & Career Readiness. Among the works that have been compiled and/or referenced are the following: Common Core State Standards for Mathematics and the Appendix from the Common Core State Standards Initiative; Learning Progressions from The University of Arizona's Institute for Mathematics and Education, chaired by Dr. William McCallum; the Arizona Academic Content Standards; the North Carolina Instructional Support Tools; and numerous math practitioners currently in the classroom.

We hope you will find the concentrated and consolidated resource of value in your own planning. We also hope you will use this resource to facilitate discussion with your colleagues and, perhaps, as a lever to help assess targeted professional learning opportunities.

Understanding the Organization

The Overview acts as a quick-reference table of contents as it shows you each of the domains and related clusters covered in this specific grade-level booklet. This can help serve as a reminder of what clusters are part of which domains and can reinforce the specific domains for each grade level.

Key Changes identifies what has been moved to and what has been moved from this particular grade level, as appropriate. This section also includes **Critical Areas of Focus**, which is designed to help you begin to approach how to examine your curriculum, resources, and instructional practices. A review of the **Critical Areas of Focus** might enable you to target specific areas of professional learning to refresh, as needed.

Math Fluency Standards	
K	Add/subtract within 5
1	Add/subtract within 10
2	Add/subtract within 20 Add/subtract within 100 (pencil & paper)
3	Multiply/divide within 100 Add/subtract within 1000
4	Add/subtract within 1,000,000
5	Multi-digit multiplication
6	Multi-digit division Multi-digit decimal operations
7	Solve $px + q = r$, $p(x + q) = r$
8	Solve simple 2 x 2 systems by inspection

For each domain is the domain itself and the associated clusters. Within each domain are sections for each of the associated clusters. The cluster-specific content can take you to a deeper level of understanding. Perhaps most importantly, we include here the **Learning Progressions.** The **Learning Progressions** provide context for the current domain and its related standards. For any grade except Kindergarten, you will see the domain-specific standards for the current grade in the center column. To the left are the domain-specific standards for the preceding grade and to the right are the domain-specific standards for the following grade. Combined with the **Critical Areas of Focus,** these Learning Progressions can assist you in focusing your planning.

For each cluster, we have included four key sections: Description, Big Idea, Academic Vocabulary, and Deconstructed Standard.

The cluster **Description** offers clarifying information, but also points to the **Big Idea** that can help you focus on that which is most important for this cluster within this domain. The **Academic Vocabulary** is derived from the cluster description and serves to remind you of potential challenges or barriers for your students.

Each standard specific to that cluster has been deconstructed. There **Deconstructed Standard** for each standard specific to that cluster and each **Deconstructed Standard** has its own subsections, which can provide you with additional guidance and insight as you plan. Note the deconstruction drills down to the sub-standards when appropriate. These subsections are:

- Standard Statement
- Standard Description
- Essential Question(s)
- Mathematical Practice(s)
- DOK Range Target for Learning and Assessment
- Learning Expectations
- Explanations and Examples

As noted, first are the **Standard Statement** and **Standard Description**, which are followed by the **Essential Question(s)** and the associated **Mathematical Practices**. The **Essential Question(s)** amplify the **Big Idea**, with the intent of taking you to a deeper level of understanding; they may also provide additional context for the **Academic Vocabulary**.

The **DOK Range Target for Learning and Assessment** remind you of the targeted level of cognitive demand. The **Learning Expectations** correlate to the DOK and express the student learning targets for student proficiency for KNOW, THINK, and DO, as appropriate. In some instances, there may be no learning targets for student proficiency for one or more of KNOW, THINK or DO. The learning targets are expressions of the deconstruction of the Standard as well as the alignment of the DOK with appropriate consideration of the Essential Questions.

The last subsection of the **Deconstructed Standard** includes **Explanations and Examples**. This subsection might be quite lengthy as it can include additional context for the standard itself as well as examples of what student work and student learning could look like. **Explanations and Examples** may offers ideas for instructional practice and lesson plans.

Standards for Mathematical Practice in Kindergarten

Each of the explanations below articulates some of the knowledge and skills expected of students to demonstrate grade-level mathematical proficiency.

PRACTICE	EXPLANATION
Make sense and persevere in problem solving.	Students begin to develop effective dispositions toward problem solving. In learning situations offering informal and formal possibilities for solving problems, young children develop the ability to focus attention, take reasonable risks, try alternatives, exhibit self-regulation, and persevere (Copley, 2010). Using both verbal and nonverbal means, kindergarten students can begin to explain the meaning of a problem, look for ways to solve it, and determine if their thinking makes sense.
Reason abstractly and quantitatively.	Students begin to use numerals to represent specific amount (quantity), showing developing understanding that the numeral "11" represents 11 counted objects. In addition, students can begin to draw pictures, manipulate objects, use diagrams or charts, etc. to express quantitative ideas.
Construct viable arguments and critique the reasoning of others.	Students begin to clearly express, explain, organize and consolidate their math thinking using both verbal and written representations. Through opportunities that encourage exploration, discovery, and discussion, students begin to learn how to express opinions and become skillful at listening to others. They begin to develop the ability to reason and analyze situations as they consider questions such as, "Do you think that would happen all the time...?"And "I wonder why...?"
Model with mathematics.	Students begin to experiment with representing real-life problem situations with numbers, in words (mathematical language), and suing graphical representations.
Use appropriate tools strategically.	Students begin to explore various tools, such as concrete and virtual manipulatives, and use them to investigate mathematical concepts. Based on these experiences, they begin to learn how to decide which tools may be helpful depending on the problem or task.
Attend to precision.	As their mathematical vocabulary increases due to exposure, modeling, and practice, students become more precise in their communication, calculations, and measurements. Students begin to describe their actions and strategies more clearly, understand and use grade-level appropriate vocabulary more accurately, and begin to give more precise explanations and reasoning regarding their process of finding solutions.
Look for and make use of structure.	Students begin to look for patterns and structures in the number system and other areas of mathematics.
Look for and express regularity in repeated reasoning.	Students begin to notice repetitive actions in geometry, counting, comparing, etc.

KINDERGARTEN

LEXILE GRADE LEVEL BANDS: NOT APPLICABLE

OVERVIEW

Counting and Cardinality (CC)

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

Operations and Algebraic Thinking (OA)

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

Number and Operations in Base Ten (NBT)

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

Measurement and Data (MD)

- Describe and compare measurable attributes.
- Classify objects and count the number of objects in each category

Geometry (G)

- Identify and describe shapes.
- Analyze, compare, create, and compose shapes.

Mathematical Practices (MP)

MP 1. Make sense of problems and persevere in solving them.

MP 2. Reason abstractly and quantitatively.

MP 3. Construct viable arguments and critique the reasoning of others.

MP 4. Model with mathematics.

MP 5. Use appropriate tools strategically.

MP 6. Attend to precision.

MP 7. Look for and make use of structure.

MP 8. Look for and express regularity in repeated reasoning.

KEY CHANGES	
NEW TO KINDERGARTEN	▪ Fluently add and subtract within 5 (K.CC.5) ▪ Compose and decompose numbers from 11 to 19 into ten ones and some further ones (K.NBT.1) ▪ Identify and describe shapes (NEW: squares, hexagons, cones, cylinders) (K.G) ▪ Identify shapes as two-dimensional or three-dimensional (K.G.3) ▪ Compose simple shapes to form larger shapes (K.G.6)
MOVED FROM KINDERGARTEN	▪ Ordinals (1.01e) ▪ Equal Shares (1.02) ▪ Calendar Concepts & Time (2.02) ▪ Data Collection (4.01, 4.02) ▪ Repeating Patterns (5.02)

KINDERGARTEN

LEXILE GRADE LEVEL BANDS: NOT APPLICABLE

KEY CHANGES

CRITICAL AREAS OF FOCUS	**1. Representing, relating, and operating on whole numbers, initially with sets of objects.** ▪ Students use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set; counting out a given number of objects; comparing sets or numerals; and modeling simple joining and separating situations with sets of objects, or eventually with equations such as $5 + 2 = 7$ and $7 - 2 = 5$. (Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.) ▪ Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away. **2. Describing shapes and space.** ▪ Students describe their physical world using geometric ideas (e.g., shape, orientation, spatial relations) and vocabulary. They identify, name, and describe basic two-dimensional shapes, such as squares, triangles, circles, rectangles, and hexagons, presented in a variety of ways (e.g., with different sizes and orientations), as well as three-dimensional shapes such as cubes, cones, cylinders, and spheres. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.

DOMAIN:

COUNTING AND CARDINALITY (CC)

KINDERGARTEN

MATHEMATICS

DOMAIN	Counting and Cardinality (CC)
CLUSTERS	1. Know number names and the count sequence. 2. Count to tell the number of objects. 3. Compare numbers.

COUNTING AND CARDINALITY (CC)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
COUNTING		
Section 1: Principles of Counting	***Section 1: Principles of Counting***	***Section 1: Principles of Counting***
K.CC.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies (include groups with up to ten objects).		
K.CC.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.		
K.CC.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.		
K.CC.4.c Understand that each successive number-name refers to a quantity that is one larger.		
K.CC.7 Compare two numbers between 1 and 10 presented as written numerals.		
K.CC.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies (include groups with up to ten objects).		
Section 2: Counting Numbers from 11 to 20	***Section 2: Counting Numbers from 11 to 20***	***Section 2: Counting Numbers from 11 to 20***
K.CC.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).		
K.CC.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1 - 20, count out that many objects.		
K.CC.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0 – 20 (with 0 representing a count of no objects).		

COUNTING AND CARDINALITY (CC)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
COUNTING		
Section 3: Counting to 100 and Beyond	***Section 3: Counting to 100 and Beyond***	***Section 3: Counting to 100 and Beyond***
K.CC.1 Count to 100 by ones and by tens.	1.NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.
		2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number-names, and expanded form.

Source: turnonccmath.net, NC State University College of Education

CLUSTER:	**1. Know number names and the count sequence. (CC)**
	Kindergartners are fascinated with counting, often before they know how to count. This enthusiasm provides an ideal environment for learning to count by ones, and then tens, which is a basis for understanding the number system and for most mathematics work in the primary grades.
BIG IDEA:	Counting has a numerical sequence that can be used to determine the quanitity of a set of objects and that quanitity can be represented by written numerals.
ACADEMIC VOCABULARY:	zero-one hundred

STANDARD AND DECONSTRUCTION

K.CC.1	**Count to 100 by ones and by tens.**		
DESCRIPTION	Students rote count by starting at one and counting to 100. When students count by tens they are only expected to master counting on the decade (0, 10, 20, 30, 40 …). This objective does not require recognition of numerals. It is focused on the rote number sequence.		
ESSENTIAL QUESTION(S)	How high can I count?		
MATHEMATICAL PRACTICE(S)	K.MP.7. Look for and make use of structure. K.MP.8. Look for and express regularity in repeated reasoning.		
DOK Range Target for Instruction & Assessment	☒ 1 ☐ 2 ☐ 3 ☐ 4		
Learning Expectations	Know: Concepts/Skills	Think	Do
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Count verbally to 100 by ones starting at 0 Count verbally to 100 by tens		

EXPLANATIONS AND EXAMPLES

The emphasis of this standard is on the counting sequence.

When counting by ones, students need to understand that the next number in the sequence is one more. When counting by tens, the next number in the sequence is "ten more" (or one more group of ten).

Instruction on the counting sequence should be scaffolded (e.g., 1-10, then 1-20, etc.).

Counting should be reinforced throughout the day, not in isolation.

Examples:

- Count the number of chairs of the students who are absent.
- Count the number of stairs, shoes, etc.

When counting orally, students should recognize the patterns that exist from 1 to 100. They should also recognize the patterns that exist when counting by 10s.

STANDARD AND DECONSTRUCTION

K.CC.2	**Count forward beginning from a given number within the known sequence (instead of having to begin at 1).**		
DESCRIPTION	Students begin a rote forward counting sequence from a number other than 1. Thus, given the number 4, the student would count, "4, 5, 6, 7 …" This objective does not require recognition of numerals. It is focused on the rote number sequence 0-100.		
ESSENTIAL QUESTION(S)	Where can I start counting from?		
MATHEMATICAL PRACTICE(S)	K.MP.7. Look for and make use of structure.		
DOK Range Target for Instruction & Assessment	☒ 1 ☐ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Count forward verbally by ones beginning with another number other than 1		
EXPLANATIONS AND EXAMPLES	The emphasis of this standard is on the counting sequence to 100. Students should be able to count forward from any number, 1-99.		

STANDARD AND DECONSTRUCTION

K.CC.3	**Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).**
DESCRIPTION	Students write the numerals 0-20 and use the written numerals 0-20 to represent the amount within a set. For example, if the student has counted 9 objects, then the written numeral "9" is recorded. Students can record the quantity of a set by selecting a number card/tile (numeral recognition) or writing the numeral. Students can also create a set of objects based on the numeral presented. For example, if a student picks up the number card "13", the student then creates a pile of 13 counters. While children may experiment with writing numbers beyond 20, this standard places emphasis on numbers 0-20. 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.
ESSENTIAL QUESTION(S)	How can I write how many objects there are?
MATHEMATICAL PRACTICE(S)	K.MP.2. Reason abstractly and quantitatively. K.MP.7. Look for and make use of structure. K.MP.8. Look for and express regularity in repeated reasoning.
DOK Range Target for Instruction & Assessment	☒ 1 ☐ 2 ☐ 3 ☐ 4

Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Write numbers 0 to 20. Write the number that represents a given number of objects from 0-20.		

EXPLANATIONS AND EXAMPLES

Students should be given multiple opportunities to count objects and recognize that a number represents a specific quantity. Once this is established, students begin to read and write numerals (numerals are the symbols for the quantities). The emphasis should first be on quantity and then connecting quantities to the written symbols..

A sample unit sequence might include::

1. Counting up to 20 objects in many settings and situations over several weeks.
2. Beginning to recognize, identify, and read the written numerals, and match the numerals to given sets of objects.
3. Writing the numerals to represent counted objects.

Since the teen numbers are not written as they are said, teaching the teen numbers as one group of ten and extra ones is foundational to understanding both the concept and the symbol that represents each teen number. For example, when focusing on the number "14," students should count out fourteen objects using one-to-one correspondence and then use those objects to make one group of ten and four extra ones. Students should connect the representation to the symbol "14."

CLUSTER:	**2. Count to tell the number of objects. (CC)**
	Students use numbers, including written numerals, to represent quantities and to solve quantitative problems such as counting objects in a set, counting out a given number of objects, and comparing sets or numerals. When learning to count, it is important for kindergarten students to connect the collection of items (4 cubes), the number word ("four"), and the numeral (4), ultimately creating a mental picture of a number. If students simply rote-count a collection of objects without connecting these three components together, they "engage in a meaningless exercise of calling numbers that are one more than the last." (Midget, 2012). Subitizing, the ability to "instantly see how many" (Clements, 1999), helps students form a mental picture of a number. When students recognize a small collection of objects (e.g., 2 sets of two dots) as one group (e.g., four) – they are beginning to unitize. This ability to see a set of objects as a group is an important step toward being able to see smaller groups of objects within a total collection- which is necessary to decompose number. Materials such as dot cards, dice, and dominoes provide students opportunities to see a variety of patterned arrangements to develop instant recognition of small amounts..
BIG IDEA:	Counting has a numerical sequence that can be used to determine the quanitity of a set of objects and that quanitity can be represented by written numerals..
ACADEMIC VOCABULARY:	zero - one hundred, whole, group, set, pattern

STANDARD AND DECONSTRUCTION

K.CC.4	**Understand the relationship between numbers and quantities; connect counting to cardinality.**
DESCRIPTION	Students write the numerals 0-20 and use the written numerals 0-20 to represent the amount within a set. For example, if the student has counted 9 objects, then the written numeral "9" is recorded. Students can record the quantity of a set by selecting a number card/tile (numeral recognition) or writing the numeral. Students can also create a set of objects based on the numeral presented. For example, if a student picks up the number card "13", the student then creates a pile of 13 counters. While children may experiment with writing numbers beyond 20, this standard places emphasis on numbers 0-20. 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.
ESSENTIAL QUESTION(S)	How do I know how many objects there are?
MATHEMATICAL PRACTICE(S)	K.MP.2. Reason abstractly and quantitatively. K.MP.7. Look for and make use of structure. K.MP.8. Look for and express regularity in repeated reasoning. K.CC.4a: When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
DOK Range Target for Instruction & Assessment	☐ 1 ☒ 2 ☒ 3 ☐ 4

Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:		Match each object with one and only one number name and each number with one and only one object.	Say the number names in order while matching each object with a number when counting objects.

SUBSTANDARD DECONSTRUCTED	K.CC.4B Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.		
DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:		Recognize the number of objects is the same regardless of their arrangement or the order in which they were counted. Realize that the last number name said tells the number of objects counted.	

SUBSTANDARD DECONSTRUCTED	Understand that each successive number name refers to a quantity that is one larger.		
DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:		Generalize that each successive number name refers to a quantity that is one larger .	

EXPLANATIONS AND EXAMPLES

This standard focuses on one-to-one correspondence and how cardinality connects with quantity.

- For example, when counting three bears, the student should use the counting sequence, "1-2-3," to count the bears and recognize that "three" represents the group of bears, not just the third bear. A student may use an interactive whiteboard to count objects, cluster the objects, and state, "This is three".

In order to understand that each successive number name refers to a quantity that is one larger, students should have experience counting objects, placing one more object in the group at a time.

- For example, using cubes, the student should count the existing group, and then place another cube in the set. Some students may need to re-count from one, but the goal is that they would count on from the existing number of cubes. S/he should continue placing one more cube at a time and identify the total number in order to see that the counting sequence results in a quantity that is one larger each time one more cube is placed in the group.

- A student may use a clicker (electronic response system) to communicate his/her count to the teacher.

STANDARD AND DECONSTRUCTION

K.CC.5	**Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.**		
DESCRIPTION	In order to answer "how many?" students need to keep track of objects when counting. Keeping track is a method of counting that is used to count each item once and only once when determining how many. After numerous experiences with counting objects, along with the developmental understanding that a group of objects counted multiple times will remain the same amount, students recognize the need for keeping track in order to accurately determine "how many". Depending on the amount of objects to be counted, and the students' confidence with counting a set of objects, students may move the objects as they count each, point to each object as counted, look without touching when counting, or use a combination of these strategies. It is important that children develop a strategy that makes sense to them based on the realization that keeping track is important in order to get an accurate count, as opposed to following a rule, such as "Line them all up before you count", in order to get the right answer. As children learn to count accurately, they may count a set correctly one time, but not another. Other times they may be able to keep track up to a certain amount, but then lose track from then on. Some arrangements, such as a line or rectangular array, are easier for them to get the correct answer but may limit their flexibility with developing meaningful tracking strategies, so providing multiple arrangements help children learn how to keep track. Since scattered arrangements are the most challenging for students, this standard specifies that students only count up to 10 objects in a scattered arrangement and count up to 20 objects in a line, rectangular array, or circle.		
ESSENTIAL QUESTION(S)	What does a numeral represent?		
MATHEMATICAL PRACTICE(S)	K.MP.2. Reason abstractly and quantitatively. K.MP.7. Look for and make use of structure. K.MP.8. Look for and express regularity in repeated reasoning.		
DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Count up to 20 objects that have been arranged in a line, rectangular array, or circle. Count as many as 10 items in a scattered configuration.	Match each object with one and only one number name and each number with one and only one object. Conclude that the last number of the counted sequence signifies the quantity of the counted collection.	Given a number from 1-20, count that many objects.

EXPLANATIONS AND EXAMPLES

Students should develop counting strategies to help them organize the counting process to avoid re-counting or skipping objects.

Examples:

- If items are placed in a circle, the student may mark or identify the starting object.
- If items are in a scattered configuration, the student may move the objects into an organized pattern.
- Some students may choose to use grouping strategies such as placing objects in twos, fives, or tens (note: this is not a kindergarten expectation).
- Counting up to 20 objects should be reinforced when collecting data to create charts and graphs.
- A student may use a clicker (electronic response system) to communicate his/her count to the teacher.

CLUSTER:	**3. Compare numbers. (CC)**
	Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. (Include groups with up to ten objects.).
BIG IDEA:	Compare groups of objects and written numerals using greater than, less than, and equal to.
ACADEMIC VOCABULARY:	greater, more, less, fewer, equal, same amount

STANDARD AND DECONSTRUCTION

K.CC.6

Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. (Include groups with up to ten objects.)

DESCRIPTION

Students use their counting ability to compare sets of objects (0-10). They may use matching strategies (Student 1), counting strategies (Student 2), or equal shares (Student 3), to determine whether one group is greater than, less than, or equal to the number of objects in another group.

Student 1	Student 2	Student 3
I lined up one square and one triangle. Since there is one extra triangle, there are more triangles than squares. 	I counted the squares and I got 4. Then I counted the triangles and got 5. Since 5 is bigger than 4, there are more triangles than squares.	I put them in a pile. I then took away objects. Every time I took a square, I also took a triangle. When I had taken almost all of the shapes away, there was still a triangle left. That means that there are more triangles than squares.

ESSENTIAL QUESTION(S)

How are these groups of objects alike and different?

MATHEMATICAL PRACTICE(S)

K.MP.2. Reason abstractly and quantitatively.

K.MP.7. Look for and make use of structure.

K.MP.8. Look for and express regularity in repeated reasoning.

DOK Range Target for Instruction & Assessment

☒ 1 ☒ 2 ☐ 3 ☐ 4

Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Describe greater than, less than, or equal to.	Determine whether a group of 10 or fewer objects is greater than, less than, or equal to another group of 10 or fewer objects.	

EXPLANATIONS AND EXAMPLES

Students should develop a strong sense of the relationship between quantities and numerals before they begin comparing numbers.

Other strategies:

- Matching: Students use one-to-one correspondence, repeatedly matching one object from one set with one object from the other set to determine which set has more objects.
- Counting: Students count the objects in each set, and then identify which set has more, less, or an equal number of objects.
- Observation: Students may use observation to compare two quantities (e.g., by looking at two sets of objects, they may be able to tell which set has more or less without counting).
- Observations in comparing two quantities can be accomplished through daily routines of collecting and organizing data in displays. Students create object graphs and pictographs using data relevant to their lives (e.g., favorite ice cream, eye color, pets, etc.). Graphs may be constructed by groups of students as well as by individual students.
- Benchmark Numbers: This would be the appropriate time to introduce the use of 0, 5, and 10 as benchmark numbers to help students further develop their sense of quantity as well as their ability to compare numbers.
- Students state whether the number of objects in a set is more, less, or equal to a set that has 0, 5, or 10 objects.

STANDARD AND DECONSTRUCTION

K.CC.7	**Compare two numbers between 1 and 10 presented as written numerals.**		
DESCRIPTION	Students apply their understanding of numerals 1-10 to compare one numeral to another. Thus, looking at the numerals 8 and 10, a student is able to recognize that the numeral 10 represents a larger amount than the numeral 8. Students need ample experiences with actual sets of objects (K.CC.3 and K.CC.6) before completing this standard with only numerals.		
ESSENTIAL QUESTION(S)	What do I know about these two numbers? How are these two numbers alike and different?		
MATHEMATICAL PRACTICE(S)	K.MP.2. Reason abstractly and quantitatively.		
DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Know the quantity of each numeral 1-10.	Compare written numbers to determine if they are greater than, less than, or equal to each other.	Given two numerals, students should determine which is greater or less than the other.
EXPLANATIONS AND EXAMPLES	Given two numerals, students should determine which is greater or less than the other.		

DOMAIN:

OPERATIONS AND ALGEBRAIC THINKING (OA)

FIRST GRADE

MATHEMATICS

KINDERGARTEN

LEXILE GRADE LEVEL BANDS: NOT APPLICABLE

DOMAIN	Operations and Algebraic Thinking (OA)
CLUSTERS	1. Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

OPERATIONS AND ALGEBRAIC THINKING (OA)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
ADDITION AND SUBTRACTION		
Section 1: Addition and Subtraction Within 10	***Section 1: Addition and Subtraction Within 10***	***Section 1: Addition and Subtraction Within 10***
K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.		
K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).		
K.OA.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.		
K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.		
K.OA.5 Fluently add and subtract within 5.		
Section 2: Addition and Subtraction Within 100	***Section 2: Addition and Subtraction Within 100***	***Section 2: Addition and Subtraction Within 100***
	1.OA.4 Understand subtraction as an unknown-addend problem.	
	1.OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	
	1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	
	1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	

OPERATIONS AND ALGEBRAIC THINKING (OA)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
ADDITION AND SUBTRACTION		
Section 2: Addition and Subtraction Within 100	***Section 2: Addition and Subtraction Within 100***	***Section 2: Addition and Subtraction Within 100***
	1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	
	1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 - 4 = 13 - 3 - 1 = 10 - 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 - 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).	
	1.OA.3 Apply properties of operations as strategies to add and subtract.	
Section 3: Addition and Subtraction Within 1000	***Section 3: Addition and Subtraction Within 1000***	***Section 3: Addition and Subtraction Within 1000***
		2.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
		2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
		2.OA.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
		2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
		2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
		2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.
		2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

OPERATIONS AND ALGEBRAIC THINKING (OA)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
EARLY EQUATIONS AND EXPRESSIONS		
Section 2: Exploring Equations	***Section 2: Exploring Equations***	***Section 2: Exploring Equations***
	1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.	
	1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.	
Section 1: Equipartitioning Wholes	***Section 1: Equipartitioning Wholes***	***Section 1: Equipartitioning Wholes***
	1.G.3 Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

Source: turnonccmath.net, NC State University College of Education

CLUSTER:	**1. Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. (OA)**
	For numbers 0 – 10, Kindergarten students choose, combine, and apply strategies for answering quantitative questions. This includes quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away. Objects, pictures, actions, and explanations are used to solve problems and represent thinking. Although CCSS-M states, "Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten in encouraged, but it is not required", please note that it is not until First Grade when "Understand the meaning of the equal sign" is an expectation (1.OA .7).
BIG IDEA:	Addition and subtraction are operations that can be represented in many ways to show adding on and taking away. Decomposition of numbers, represented by drawings or objects, develops conceptual understanding of facts.
ACADEMIC VOCABULARY:	join, add, separate, subtract, and, same amount as, equal, less, more, total

STANDARD AND DECONSTRUCTION

K.OA.1	**Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem.)**
DESCRIPTION	Students demonstrate the understanding of how objects can be joined (addition) and separated (subtraction) by representing addition and subtraction situations in various ways. This objective is focused on understanding the concept of addition and subtraction, rather than reading and solving addition and subtraction number sentences (equations). Common Core State Standards for Mathematics states, "Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required." Please note that it is not until First Grade when "Understand the meaning of the equal sign" is an expectation (1.OA.7). Therefore, before introducing symbols (+, -, =) and equations, kindergarteners require numerous experiences using joining (addition) and separating (subtraction) vocabulary in order to attach meaning to the various symbols. For example, when explaining a solution, kindergarteners may state, "Three and two is the same amount as 5." While the meaning of the equal sign is not introduced as a standard until First Grade, if equations are going to be modeled and used in Kindergarten, students must connect the symbol (=) with its meaning (is the same amount/quantity as).
ESSENTIAL QUESTION(S)	1. What is addition? 2. What is subtraction?
MATHEMATICAL PRACTICE(S)	K.K.MP.1. Make sense of problems and persevere in solving them. K.MP.2. Reason abstractly and quantitatively. K.MP.4. Model with mathematics. K.MP.7. Look for and make use of structure. K.MP.8. Look for and express regularity in repeated reasoning.

DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Describe greater than, less than, or equal to.	Determine whether a group of 10 or fewer objects is greater than, less than, or equal to another group of 10 or fewer objects.	

EXPLANATIONS AND EXAMPLES

Students should develop a strong sense of the relationship between quantities and numerals before they begin comparing numbers.

Other strategies:

- Matching: Students use one-to-one correspondence, repeatedly matching one object from one set with one object from the other set to determine which set has more objects.
- Counting: Students count the objects in each set, and then identify which set has more, less, or an equal number of objects.
- Observation: Students may use observation to compare two quantities (e.g., by looking at two sets of objects, they may be able to tell which set has more or less without counting).
- Observations in comparing two quantities can be accomplished through daily routines of collecting and organizing data in displays. Students create object graphs and pictographs using data relevant to their lives (e.g., favorite ice cream, eye color, pets, etc.). Graphs may be constructed by groups of students as well as by individual students.
- Benchmark Numbers: This would be the appropriate time to introduce the use of 0, 5, and 10 as benchmark numbers to help students further develop their sense of quantity as well as their ability to compare numbers.
- Students state whether the number of objects in a set is more, less, or equal to a set that has 0, 5, or 10 objects.

STANDARD AND DECONSTRUCTION

K.OA.2 — Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

DESCRIPTION

Kindergarten students solve four types of problems within 10: Result Unknown/Add To; Result Unknown/Take From; Total Unknown/Put Together-Take Apart; and Addend Unknown/Put Together-Take Apart. Kindergarteners use counting to solve the four problem types by acting out the situation and/or using objects, fingers, and drawings.

Add To Result Unknown	Take From Result Unknown	Put Together/Take Apart Total Unknown	Put Together/Take Apart Addend Unknown
Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ?

Example: Nine grapes were in the bowl. I ate 3 grapes. How many grapes are in the bowl now?

Student: I got 9 "grapes" and put them in my bowl. Then, I took 3 grapes out of the bowl. I counted the grapes still left in the bowl… 1, 2, 3, 4, 4, 5, 6. Six. There are 6 grapes in the bowl.

Example: Six crayons are in the box. Two are red and the rest are blue. How many blue crayons are in the box?

Student: I got 6 crayons. I moved these two over and pretended they were red. Then, I counted the "blue" ones... 1, 2, 3, 4. Four. There are 4 blue crayons.

ESSENTIAL QUESTION(S)

How can I show addition?

How can I show subtraction?

MATHEMATICAL PRACTICE(S)

K.MP.1. Make sense of problems and persevere in solving them.

K.MP.2. Reason abstractly and quantitatively.

K.MP.3. Construct viable arguments and critique the reasoning of others.

K.MP.4. Model with mathematics.

K.MP.5. Use appropriate tools strategically.

DOK Range Target for Instruction & Assessment

☒ 1 ☒ 2 ☐ 3 ☐ 4

Learning Expectations	Know: Concepts/Skills	Think	Do
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Add and subtract within 10. (maximum sum and minuend is 10).	Use objects/drawings to represent an addition and subtraction word problem.	Solve addition and subtraction word problems within 10.

EXPLANATIONS AND EXAMPLES

Using a word problem context allows students to develop their understanding about what it means to add and subtract. Addition is putting together and adding to. Subtraction is taking apart and taking from. Kindergarteners develop the concept of addition/subtraction by modeling the actions in word problem using objects, fingers, mental images, drawings, sounds, acting out situations, and/or verbal explanations. Students may use different representations based on their experiences, preferences, etc. They may connect their conceptual representations of the situation using symbols, expressions, and/or equations. Students should experience the following addition and subtraction problem types (see Table 1).

- Add To word problems, such as, "Mia had 3 apples. Her friend gave her 2 more. How many does she have now?"
- A student's "think aloud" of this problem might be, "I know that Mia has some apples and she's getting some more. So she's going to end up with more apples than she started with."

Take From problems such as:

- José had 8 markers and he gave 2 away. How many does he have now? When modeled, a student would begin with 8 objects and remove two to get the result.
- Put Together/Take Apart problems with Total Unknown gives students opportunities to work with addition in another context such as:
- There are 2 red apples on the counter and 3 green apples on the counter. How many apples are on the counter?
- Solving Put Together/Take Apart problems with Both Addends Unknown provides students with experiences with finding all the decompositions of a number and investigating the patterns involved such as:
- There are 10 apples on the counter. Some are red and some are green. How many apples could be green? How many apples could be red?

Students may use a document camera or interactive whiteboard to demonstrate addition or subtraction strategies. This gives them the opportunity to communicate and justify their thinking.

STANDARD AND DECONSTRUCTION

K.OA.3	**Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).**		
DESCRIPTION	Students develop an understanding of part-whole relationships as they recognize that a set of objects (5) can be broken into smaller sub-sets (3 and 2) and still remain the total amount (5). In addition, this objective asks students to realize that a set of objects (5) can be broken in multiple ways (3 and 2; 4 and 1). Thus, when breaking apart a set (decompose), students use the understanding that a smaller set of objects exists within that larger set (inclusion). Example: "Bobby Bear is missing 5 buttons on his jacket. How many ways can you use blue and red buttons to finish his jacket? Draw a picture of all your ideas. Students could draw pictures of: 4 blue and 1 red button 3 blue and 2 red buttons 2 blue and 3 red buttons 1 blue and 4 red buttons In Kindergarten, students need ample experiences breaking apart numbers and using the vocabulary "and" & "same amount as" before symbols (+, =) and equations (5= 3 + 2) are introduced. If equations are used, a mathematical representation (picture, objects) needs to be present as well.		
ESSENTIAL QUESTION(S)	How can adddition help show a number in a different way?		
MATHEMATICAL PRACTICE(S)	K.MP.1. Make sense of problems and persevere in solving them. K.MP.2. Reason abstractly and quantitatively. K.MP.4. Model with mathematics. K.MP.7. Look for and make use of structure. K.MP.8. Look for and express regularity in repeated reasoning..		
DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Solve addition number sentences within 10.	Decompose numbers less than or equal to 10 into pairs in more than one way. Record decomposition of a number within 10 by a drawing or written equation.	

OPERATIONS & ALGEBRAIC THINKING

EXPLANATIONS AND EXAMPLES

This standard focuses on number pairs which add to a specified total, 1-10. These number pairs may be examined either in or out of context.

Students may use objects such as cubes, two-color counters, square tiles, etc. to show different number pairs for a given number. For example, for the number 5, students may split a set of 5 objects into 1 and 4, 2 and 3, etc.

Students may also use drawings to show different number pairs for a given number. For example, students may draw 5 objects, showing how to decompose in several ways.

Sample unit sequence:

- A contextual problem (word problem) is presented to the students such as, "Mia goes to Nan's house. Nan tells her she may have 5 pieces of fruit to take home. There are lots of apples and bananas. How many of each can she take?"
- Students find related number pairs using objects (such as cubes or two-color counters), drawings, and/or equations. Students may use different representations based on their experiences, preferences, etc.
- Students may write equations that equal 5 such as:
    - o 5=4+1
    - o 3+2=5
    - o 2+3=4+1

This is a good opportunity for students to systematically list all the possible number pairs for a given number. For example, all the number pairs for 5 could be listed as 0+5, 1+4, 2+3, 3+2, 4+1, and 5+0. Students should describe the pattern that they see in the addends, e.g., each number is one less or one more than the previous addend.

STANDARD AND DECONSTRUCTION

K.OA.4

For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

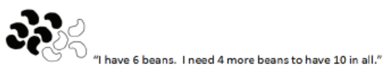
DESCRIPTION

Students build upon the understanding that a number (less than or equal to 10) can be decomposed into parts (K.OA.3) to find a missing part of 10. Through numerous concrete experiences, kindergarteners model the various sub-parts of ten and find the missing part of 10.

Example:

When working with 2-color beans, a student determines that 4 more beans are needed to make a total of 10.

In addition, kindergarteners use various materials to solve tasks that involve decomposing and composing 10.



Example:

"A full case of juice boxes has 10 boxes. There are only 6 boxes in this case. How many juice boxes are missing?

Student A: *Using a Ten-Frame*	Student B: *Think Addition*	Student C: *Fluently add/subtract*
"I used a ten frame for the case. Then, I put on 6 counters for juice still in the case. There's no juice in these 4 spaces. So, 4 are missing." 	"I counted out 10 counters because I knew there needed to be ten. I pushed these 6 over here because they were in the container. These are left over. So there's 4 missing." 	"I know that it's 4 because 6 and 4 is the same amount as 10."

ESSENTIAL QUESTION(S)

How many more will make 10?

MATHEMATICAL PRACTICE(S)

K.MP.1. Make sense of problems and persevere in solving them.

K.MP.2. Reason abstractly and quantitatively.

K.MP.4. Model with mathematics.

K.MP.7. Look for and make use of structure.

K.MP.8. Look for and express regularity in repeated reasoning.

DOK Range Target for Instruction & Assessment

☒ 1 ☐ 2 ☐ 3 ☐ 4

Learning Expectations	Know: Concepts/Skills	Think	Do
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Know that two numbers can be added together to make ten.	Using materials or representations, find the number that makes 10 when added to the given number for any number from 1 to 9, and record the answer using materials, representations, or equations.	

EXPLANATIONS AND EXAMPLES

The number pairs that total ten are foundational for students' ability to work fluently within base-ten numbers and operations. Different models, such as ten-frames, cubes, two-color counters, etc., assist students in visualizing these number pairs for ten.

Example 1:

Students place three objects on a ten frame and then determine how many more are needed to "make a ten."

Students may use electronic versions of ten frames to develop this skill.

Example 2:

The student snaps ten cubes together to make a "train."

- Student breaks the "train" into two parts. S/he counts how many are in each part and record the associated equation (10 = ___ + ___).
- Student breaks the "train" into two parts. S/he counts how many are in one part and determines how many are in the other part without directly counting that part. Then s/he records the associated equation (if the counted part has 4 cubes, the equation would be 10 = 4 + ___).
- Student covers up part of the "train", without counting the covered part. S/he counts the cubes that are showing and determines how many are covered up. Then s/he records the associated equation (if the counted part has 7 cubes, the equation would be 10 = 7 + ___).

Example 3:

The student tosses ten two-color counters on the table and records how many of each color are facing up.

STANDARD AND DECONSTRUCTION

K.OA.5	**Fluently add and subtract within 5.**
DESCRIPTION	Students are fluent when they display accuracy (correct answer), efficiency (a reasonable amount of steps in about 3-5 seconds without resorting to counting), and flexibility (using strategies such as the distributive property). Students develop fluency by understanding and internalizing the relationships that exist between and among numbers. Oftentimes, when children think of each "fact" as an individual item that does not relate to any other "fact", they are attempting to memorize separate bits of information that can be easily forgotten. Instead, in order to fluently add and subtract, children must first be able to see sub-parts within a number (inclusion, K.CC.4.c).
ESSENTIAL QUESTION(S)	Fluently add and subtract within 5.
MATHEMATICAL PRACTICE(S)	K.MP.2. Reason abstractly and quantitatively. K.MP.7. Look for and make use of structure. K.MP.8. Look for and express regularity in repeated reasoning.
DOK Range Target for Instruction & Assessment	☒ 1 ☐ 2 ☐ 3 ☐ 4

Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Fluently, with speed and accuracy, add and subtract within 5.		

EXPLANATIONS AND EXAMPLES

This standard focuses on students being able to add and subtract numbers within 5. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently.

Strategies students may use to attain fluency include:

- Counting on (e.g., for 3+2, students will state, "3," and then count on two more, "4, 5," and state the solution is "5").
- Counting back (e.g., for 4-3, students will state, "4," and then count back three, "3, 2, 1" and state the solution is "1").
- Counting up to subtract (e.g., for 5-3, students will say, "3," and then count up until they get to 5, keeping track of how many they counted up, stating that the solution is "2").
- Using doubles (e.g., for 2+3, students may say, "I know that 2+2 is 4, and 1 more is 5").
- Using commutative property (e.g., students may say, "I know that 2+1=3, so 1+2=3").
- Using fact families (e.g., students may say, "I know that 2+3=5, so 5-3=2").

Students may use electronic versions of five frames to develop fluency of these facts.

DOMAIN:

NUMBER AND OPERATIONS IN BASE TEN (NBT)

KINDERGARTEN

MATHEMATICS

KINDERGARTEN

LEXILE GRADE LEVEL BANDS: NOT APPLICABLE

DOMAIN	Number and Operations in Base Ten (NBT)
CLUSTERS	1. Work with numbers 11-19 to gain foundations for place value.

NUMBER OPERATIONS IN BASE TEN (NBT)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
PLACE VALUE AND DECIMALS		
Section 1: Two-digit Whole Numbers	***Section 1: Two-digit Whole Numbers***	***Section 1: Two-digit Whole Numbers***
K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	1.NBT.2.a 10 can be thought of as a bundle of ten ones, called a "ten."	
	1.NBT.2.b The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.	
	1.NBT.2.c The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).	
	1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	
	1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	
	1.OA.3 Apply properties of operations as strategies to add and subtract.	
	K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	
Section 2: Three-digit Whole Numbers	***Section 2: Three-digit Whole Numbers***	***Section 2: Three-digit Whole Numbers***
		2.NBT.1.a 100 can be thought of as a bundle of ten tens, called a "hundred."
		2.NBT.1.b The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
		2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.
		2.NBT.8 Mentally add 10 or 100 to a given number 100 - 900, and mentally subtract 10 or 100 from a given number 100 - 900.
		2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

NUMBER OPERATIONS IN BASE TEN (NBT)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
TIME AND MONEY		
Section 1: Time	***Section 1: Time***	***Section 1: Time***
	1.MD.3 Tell and write time in hours and half-hours using analog and digital clocks.	2.MD.7 Read and write time (digital and analog) to nearest 5 minutes.
Section 1: Time	***Section 1: Time***	***Section 1: Time***
		2.MD.8 Solve word problems involving money (dollars, quarters, dimes, nickels, and pennies) including symbols.
ADDITION AND SUBTRACTION		
Section 1: Addition and Subtraction Within 10	***Section 1: Addition and Subtraction Within 10***	***Section 1: Addition and Subtraction Within 10***
K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.		
K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).		
K.OA.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.		
K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.		
K.OA.5 Fluently add and subtract within 5.		
Section 2: Addition and Subtraction Within 100	***Section 2: Addition and Subtraction Within 100***	***Section 2: Addition and Subtraction Within 100***
	1.OA.4 Understand subtraction as an unknown-addend problem.	
	1.OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	
	1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	

NUMBER OPERATIONS IN BASE TEN (NBT)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
ADDITION AND SUBTRACTION		
Section 2: Addition and Subtraction Within 100	***Section 2: Addition and Subtraction Within 100***	***Section 2: Addition and Subtraction Within 100***
	1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	
	1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	
	1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 - 4 = 13 - 3 - 1 = 10 - 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 - 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).	
	1.OA.3 Apply properties of operations as strategies to add and subtract.	

Source: turnonccmath.net, NC State University College of Education

CLUSTER:	**1. Work with numbers 11-19 to gain foundations for place value. (NBT)**
	Rather than unitizing a ten (recognizing that a set of 10 objects is a unit called a "ten"), which is a standard for First Grade (1.NBT.1a), kindergarteners keep each count as a single unit as they explore a set of 10 objects and leftovers.
BIG IDEA:	Numbers beyond 10 represent ten ones and an amount of ones, building a foundation for place value understanding.
ACADEMIC VOCABULARY:	(one, two… thirteen, fourteen, … nineteen), leftovers

STANDARD AND DECONSTRUCTION

K.NBT.1

Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 +8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

DESCRIPTION

Students explore numbers 11-19 using representations, such as manipulatives or drawings. Keeping each count as a single unit, kindergarteners use 10 objects to represent "10" rather than creating a unit called a ten (unitizing) as indicated in the First Grade CCSS standard 1.NBT.1a: 10 can be thought of as a bundle of ten ones — called a "ten."

Example:

Teacher: "I have some chips here. Do you think they will fit on our ten frame? Why? Why Not?"

Students: Share thoughts with one another.

Teacher: "Use your ten frame to investigate."

Students: "Look. There's too many to fit on the ten frame. Only ten chips will fit on it."

Teacher: "So you have some leftovers?"

Students: "Yes. I'll put them over here next to the ten frame."

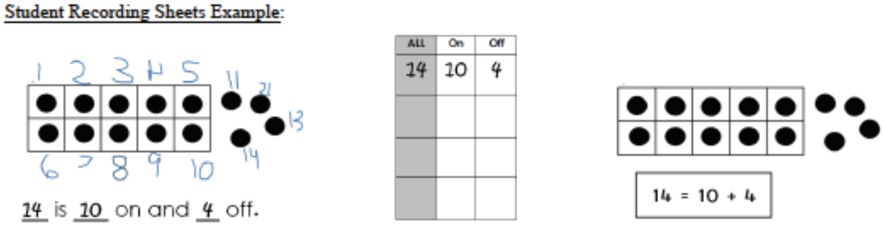
Teacher: "So, how many do you have in all?"

Student A: "One, two, three, four, five… ten, eleven, twelve, thirteen, fourteen. I have fourteen. Ten fit on and four didn't."

Student B: Pointing to the ten frame, "See them- that's 10… 11, 12, 13, 14. There's fourteen."

Teacher: Use your recording sheet (or number sentence cards) to show what you found out.

Student Recording Sheets Example:



ESSENTIAL QUESTION(S)

How can I show a number (11-19)?

What does a two-digit number (11-19) mean?

MATHEMATICAL PRACTICE(S)

K.MP.1. Make sense of problems and persevere in solving them.

K.MP.2. Reason abstractly and quantitatively.

K.MP.4. Model with mathematics.

K.MP.7. Look for and make use of structure.

K.MP.8. Look for and express regularity in repeated reasoning.

DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Know that the numbers 11-19 represents a quantity.	Understand that numbers 11-19 are composed of 10 ones and one, two, three, four, five, six, seven, eight, or nine ones. Represent compositions or decompositions of 11-19 by a drawing or equation.	Compose numbers 11-19 into 10 ones and some further ones using objects and drawings. Decompose numbers 11-19 into 10 ones and some further ones using objects and drawings.

EXPLANATIONS AND EXAMPLES

Students should develop a strong sense of the relationship between quantities and numerals before they begin comparing numbers.

Other strategies:

- Matching: Students use one-to-one correspondence, repeatedly matching one object from one set with one object from the other set to determine which set has more objects.
- Counting: Students count the objects in each set, and then identify which set has more, less, or an equal number of objects.
- Observation: Students may use observation to compare two quantities (e.g., by looking at two sets of objects, they may be able to tell which set has more or less without counting).
- Observations in comparing two quantities can be accomplished through daily routines of collecting and organizing data in displays. Students create object graphs and pictographs using data relevant to their lives (e.g., favorite ice cream, eye color, pets, etc.). Graphs may be constructed by groups of students as well as by individual students.
- Benchmark Numbers: This would be the appropriate time to introduce the use of 0, 5, and 10 as benchmark numbers to help students further develop their sense of quantity as well as their ability to compare numbers.
- Students state whether the number of objects in a set is more, less, or equal to a set that has 0, 5, or 10 objects.

DOMAIN:

MEASUREMENT AND DATA (MD)

KINDERGARTEN

MATHEMATICS

KINDERGARTEN

LEXILE GRADE LEVEL BANDS: NOT APPLICABLE

DOMAIN	Measurement and Data (MD)
CLUSTERS	1. Describe and compare measurable attributes. 2. Classify objects and count the number of objects in each category.

MEASUREMENT AND DATA (MD)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
TIME AND MONEY		
Section 1: Time	***Section 1: Time***	***Section 1: Time***
	1.MD.3 Tell and write time in hours and half-hours using analog and digital clocks.	2.MD.7 Read and write time (digital and analog) to nearest 5 minutes.
Section 2: Money	***Section 2: Money***	***Section 2: Money***
		2.MD.8 Solve word problems involving money (dollars, quarters, dimes, nickels, and pennies) including symbols.
LENGTH' AREA AND VOLUME		
Section 1: Attributes, Measuring Length by Direct Comparison	***Section 1: Attributes, Measuring Length by Direct Comparison***	***Section 1: Attributes, Measuring Length by Direct Comparison***
K.MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.		
K.MD.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.		
1.MD.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.		
Section 2: Length Measurement using Units and Tools	***Section 2: Length Measurement using Units and Tools***	***Section 2: Length Measurement using Units and Tools***
	1.MD.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.	2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
		2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
		2.MD.3 Estimate lengths using units of inches, feet, centimeters, and meters.
		2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

MEASUREMENT AND DATA (MD)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
ELEMENTARY DATA AND MONITORING		
Section 1: Attributes and Categories	***Section 1: Attributes and Categories***	***Section 1: Attributes and Categories***
		2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
		2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2,..., and represent whole-number sums and differences within 100 on a number line diagram.
K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.	1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	
		2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
		2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

Source: turnonccmath.net, NC State University College of Education

CLUSTER:	**1. Describe and compare measurable attributes. (MD)**
	Describe and compare measurable attributes and communiate precisely by engaging in discussion about their reasoning using appropriate mathematical language.
BIG IDEA:	Objects have measurable attributes that can be described and compared to other objects.
ACADEMIC VOCABULARY:	length, weight, heavy, long, more of, less of, longer, taller, shorter.

STANDARD AND DECONSTRUCTION

K.MD.1	**Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.**		
DESCRIPTION	Students describe measurable attributes of objects, such as length, weight, size, and color. For example, a student may describe a shoe with one attribute, "Look! My shoe is blue, too!", or more than one attribute, "This shoe is heavy! It's also really long." 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 measureable attributes. As they discuss these situations and compare objects using different attributes, they learn to distinguish, label, and describe several measureable attributes of a single object. Thus, teachers listen for and extend conversations about things that are "big", or "small," as well as "long," "tall," or "high," and name, discuss, and demonstrate with gestures the attribute being discussed.		
ESSENTIAL QUESTION(S)	What do I know about this object? What do I know about the size of this object?		
MATHEMATICAL PRACTICE(S)	K.MP.7. Look for and make use of structure.		
DOK Range Target for Instruction & Assessment	☒ 1 ☐ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Know that objects have measurable attributes and know what they are called, such as length and weight. Describe an object using multiple attributes such as: width, height, length, weight, etc. Describe more than one measurable attribute of a single object.		
EXPLANATIONS AND EXAMPLES	In order to describe attributes such as length and weight, students must have many opportunities to informally explore these attributes: • Students should compare objects verbally and then focus on specific attributes when making verbal comparisons for K.MD.2. They may identify measurable attributes such as length, width, height, and weight. For example, when describing a soda can, a student may talk about how tall, how wide, how heavy, or how much liquid can fit inside. These are all measurable attributes. Non-measurable attributes include: words on the object, colors, pictures, etc. . An interactive whiteboard or document camera may be used to model objects with measurable attributes.		

STANDARD AND DECONSTRUCTION

K.MD.2

Directly compare two objects with a measureable 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.

DESCRIPTION

Direct comparisons are made when objects are put next to each other, such as two children, two books, two pencils. For example, a student may line up two blocks and say, "The black block is a lot longer than the white one." Students are not comparing objects that cannot be moved and lined up next to each other.

Similar to the development of the understanding that keeping track is important to obtain an accurate count, kindergarten students need ample experiences with comparing objects in order to discover the importance of lining up the ends of objects in order to have an accurate measurement.

As this concept develops, children move from the idea that, "Sometimes this block is longer than this one and sometimes it's shorter (depending on how I lay them side by side) and that's okay," to the understanding that, "This block is always longer than this block (with each end lined up appropriately)." Since this understanding requires conservation of length, a developmental milestone for young children, kindergarteners need multiple experiences measuring a variety of items and discussing findings with one another.

"Sometimes this block is longer and sometimes it's shorter."

"The dark block is always longer than this block"

As students develop conservation of length, learning and using language such as, "It looks longer, but it really isn't longer," is helpful.

ESSENTIAL QUESTION(S)

How are these two objects alike and different?

MATHEMATICAL PRACTICE(S)

K.MP.6. Attend to precision.

K.MP.7. Look for and make use of structure.

DOK Range Target for Instruction & Assessment

☒ 1 ☒ 2 ☐ 3 ☐ 4

Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Know the meaning of a variety of attributes.	Know that two objects can be compared using a particular attribute.	Compare two objects and determine which has more or less of a measureable attribute to describe the difference.

EXPLANATIONS AND EXAMPLES

When making direct comparisons for length, students must attend to the "starting point" of each object. For example, the ends need to be lined up at the same point, or students need to compensate when the starting points are not lined up (conservation of length includes understanding that if an object is moved, its length does not change; an important concept when comparing the lengths of two objects).

Language plays an important role in this standard as students describe the similarities and differences of measurable attributes of objects (e.g., shorter than, taller than, lighter than, the same as, etc.).

An interactive whiteboard or document camera may be used to compare objects with measurable attributes.

CLUSTER:	**2. Classify objects and count the number of objects in each category. (MD)**
	Mathematically proficient students will apply their knowledge of measurable attributes to classify objects and count the accurate number of objects in categories. They will communicate precisely by engaging in discussion about their reasoning and using appropriate mathematical language.
BIG IDEA:	Objects have measurable attributes that can be described and compared to other objects.
ACADEMIC VOCABULARY:	(e.g., blue, green, red, etc.), descriptive words (e.g., small, big, rough, smooth, bumpy, round, flat, etc.), more, less, same amount

STANDARD AND DECONSTRUCTION

K.MD.3	**Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10.)**
DESCRIPTION	Students identify similarities and differences between objects (e.g., size, color, shape) and use the identified attributes to sort a collection of objects. Once the objects are sorted, the student counts the amount in each set. Once each set is counted, then the student is asked to sort (or group) each of the sets by the amount in each set. Thus, like amounts are grouped together, but not necessarily ordered. For example, when exploring a collection of buttons: First, the student separates the buttons into different piles based on color (all the blue buttons are in one pile, all the orange buttons are in a different pile, etc.). Then the student counts the number of buttons in each pile: blue (5), green (4), orange (3), purple (4). Finally, the student organizes the groups by the quantity. "I put the purple buttons next to the green buttons because purple also had (4). Blue has 5 and orange has 3. There aren't any other colors that have 5 or 3. So they are sitting by themselves." This objective helps to build a foundation for data collection in future grades as they create and analyze various graphical representations.
ESSENTIAL QUESTION(S)	What groups can make with these objects? Why did I group objects together? How many objects are in the groups?
MATHEMATICAL PRACTICE(S)	K.MP.2. Reason abstractly and quantitatively. K.MP.7. Look for and make use of structure.
DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4

Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Recognize non-measurable attributes such as shape or color. Recognize measurable attributes such as length, weight, height. Know what classify and sort means. Know that a category is the group that an object belongs to according to a particular, selected attribute. Understand one-to-one correspondence with ten or less objects.	Classify objects into categories by particular attributes.	Sort objects into categories then determine the order by number of objects in each category (limit category counts to be less than or equal to ten).

EXPLANATIONS AND EXAMPLES

Possible objects to sort include buttons, shells, shapes, beans, etc. After sorting and counting, it is important for students to:

- explain how they sorted the objects;
- label each set with a category;
- answer a variety of counting questions that ask, "How many …"; and
- compare sorted groups using words such as, "most", "least", "alike" and " different".

DOMAIN:

GEOMETRY (G)

KINDERGARTEN

MATHEMATICS

KINDERGARTEN

LEXILE GRADE LEVEL BANDS: NOT APPLICABLE

DOMAIN	Geometry (G)
CLUSTERS	1. Identify and describe shapes (square, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres). 2. Analyze, compare, create, and compose shapes.

GEOMETRY (G)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
EQUAPARTITIONING		
Section 1: Equipartitioning Wholes	***Section 1: Equipartitioning Wholes***	***Section 1: Equipartitioning Wholes***
	1.G.3 Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.
		2.G.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
SHAPES AND ANGLES		
Section 1: Shapes and Properties	***Section 1: Shapes and Properties***	***Section 1: Shapes and Properties***
K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.	1.G.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.	2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
K.G.2 Correctly name shapes regardless of their orientations or overall size.		
K.G.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").		
K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).		

GEOMETRY (G)		
KINDERGARTEN	**FIRST GRADE**	**SECOND GRADE**
SHAPES AND ANGLES		
Section 2: Composing and Decomposing Shapes	***Section 2: Composing and Decomposing Shapes***	***Section 2: Composing and Decomposing Shapes***
K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.	
K.G.6 Compose simple shapes to form larger shapes.		
K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.	

Source: turnonccmath.net, NC State University College of Education

KINDERGARTEN

LEXILE GRADE LEVEL BANDS: NOT APPLICABLE

CLUSTER:

1. Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres). (G)

This entire cluster asks students to understand that certain attributes define what a shape is called (number of sides, number of angles, etc.) and other attributes do not (color, size, orientation). Using geometric attributes, the student identifies and describes squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres. Throughout the year, Kindergarten students move from informal language to describe what shapes look like (e.g., "That looks like an ice cream cone!") to more formal mathematical language (e.g., "That is a triangle. All of its sides are the same length").

In Kindergarten, students need ample experiences exploring various forms of the shapes (e.g., size: big and small; types: triangles, equilateral, isosceles, scalene; orientation: rotated slightly to the left, 'upside down') using geometric vocabulary to describe the different shapes.

Students in Kindergarten typically recognize figures by appearance alone, often by comparing them to a known example of a shape, such as the triangle on the left (see below). For example, students in Kindergarten typically recognize that the figure on the left as a triangle, but claim that the figure on the right is not a triangle, since it does not have a flat bottom. Thus, the properties of a figure are not recognized or known. Students typically make decisions on identifying and describing shapes based on perception, not reasoning.

BIG IDEA: Shapes can be described by using names and position regardless of size.

ACADEMIC VOCABULARY: squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, spheres, flat, solid, side, corner, angle, edge, face, positional vocabulary (e.g., above, below, beside, in front of, behind, next to, same, different, etc.)

STANDARD AND DECONSTRUCTION

K.G.1

Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind, and next to.*

DESCRIPTION

Students locate and identify shapes in their environment. For example, a student may look at the tile pattern arrangement on the hall floor and say, "Look! I see squares! They are next to the triangle." At first students may use informal names e.g., "balls," "boxes," "cans". Eventually students refine their informal language by learning mathematical concepts and vocabulary and identify, compare, and sort shapes based on geometric attributes.

Students also use positional words (such as those italicized in the standard) to describe objects in the environment, developing their spatial reasoning competencies. Kindergarten students need numerous experiences identifying the location and position of actual two-and-three-dimensional objects in their classroom/school prior to describing location and position of two-and-three-dimension representations on paper.

ESSENTIAL QUESTION(S)

How can I describe a shape?

Where is the shape?

MATHEMATICAL PRACTICE(S)

K.MP.7. Look for and make use of structure.

DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Describe objects in the environment using shape words. Describe positions such as above, below, beside, in front of, behind, and next to.	Determine the relative position of 2- or 3-dimensional shapes within the environment, using the appropriate positional words to describe them.	

EXPLANATIONS AND EXAMPLES

Examples of environments in which students would be encouraged to identify shapes would include nature, buildings, and the classroom using positional words in their descriptions.

Teachers should work with children and pose four mathematical questions: Which way? How far? Where? And what objects? To answer these questions, children develop a variety of important skills contributing to their spatial thinking.

Examples:

- Teacher holds up an object such as an ice cream cone, a number cube, ball, etc. and asks students to identify the shape. Teacher holds up a can of soup and asks,"What shape is this can?" Students respond, "cylinder!"
- Teacher places an object next to, behind, above, below, beside, or in front of another object and asks positional questions. "Where is the water bottle?" (water bottle is placed behind a book) Students say, "The water bottle is behind the book."

Students should have multiple opportunities to identify shapes; these may be displayed as photographs, or pictures using the document camera or interactive whiteboard.

KINDERGARTEN

LEXILE GRADE LEVEL BANDS: NOT APPLICABLE

STANDARD AND DECONSTRUCTION

K.G.2	**Correctly name shapes regardless of their orientations or overall size.**		
DESCRIPTION	Through numerous experiences exploring and discussing shapes, students begin to understand that certain attributes define what a shape is called (number of sides, number of angles, etc.) and that other attributes do not (color, size, orientation). As the teacher facilitates discussions about shapes ("Is it still a triangle if I turn it like this?"), children question what they "see" and begin to focus on the geometric attributes. Kindergarten students typically do not yet recognize triangles that are turned upside down as triangles, since they don't "look like" triangles. Students need ample experiences manipulating shapes and looking at shapes with various typical and atypical orientations. Through these experiences, students will begin to move beyond what a shape "looks like" to identifying particular geometric attributes that define a shape.		
ESSENTIAL QUESTION(S)	What is a shape called? Why do shapes have the same name, but look different?		
MATHEMATICAL PRACTICE(S)	K.MP.7. Look for and make use of structure.		
DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Recognize that size does not affect the name of the shape. Recognize that orientation does not affect the name of the shape.	Name shapes, regardless of orientation or size.	

EXPLANATIONS AND EXAMPLES

Students should be exposed to many types of triangles in many different orientations in order to eliminate the misconception that a triangle is always right-side-up and equilateral.

Students should also be exposed to many shapes in many different sizes.

Examples:

- Teacher makes pairs of paper shapes that are different sizes. Each student is given one shape and the objective is to find the partner who has the same shape.
- Teacher brings in a variety of spheres (tennis ball, basketball, globe, ping pong ball, etc.) to demonstrate that size doesn't change the name of a shape.

STANDARD AND DECONSTRUCTION

K.G.3	**Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").**		
DESCRIPTION	Students identify objects as flat (2 dimensional) or solid (3 dimensional). As the teacher embeds the vocabulary into students' exploration of various shapes, students use the terms two-dimensional and three-dimensional as they discuss the properties of various shapes.		
ESSENTIAL QUESTION(S)	How do I know this object is two - or three - dimensional?		
MATHEMATICAL PRACTICE(S)	K.MP.7. Look for and make use of structure.		
DOK Range Target for Instruction & Assessment	☒ 1 ☐ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Define the difference between two- and three-dimensional shapes.		Determine if an object is two- or three-dimensional.
EXPLANATIONS AND EXAMPLES	Student should be able to differentiate between two - dimensional and three - dimensional shapes. • Student names a picture of a shape as two - dimensional because it is flat and can be measured in only two ways (length and width). • Student names an object as three - dimensional because it is not flat (it is a solid object/shape) and can be measured in three different ways (length, width, height/depth).		

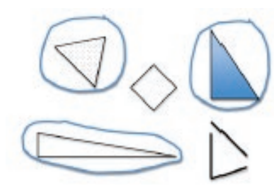
GEOMETRY

KINDERGARTEN

LEXILE GRADE LEVEL BANDS: NOT APPLICABLE

CLUSTER:	**2. Analyze, compare, create, and compose shapes. (G)**
	Students will apply their knowledge of shapes to analyze, compare, create, and compose shapes for various purposes.
BIG IDEA:	Two - and three - dimensional shapes can be analyzed and compared based on size, orientation, side lengths, and corners
ACADEMIC VOCABULARY:	squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, spheres, flat, solid, side, corner, angle, edge, face, positional vocabulary (e.g., above, below, beside, in front of, behind, next to, same, different, etc.).

STANDARD AND DECONSTRUCTION

K.G.4	**Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).**
DESCRIPTION	Students relate one shape to another as they note similarities and differences between and among 2-D and 3-D shapes using informal language. For example, when comparing a triangle and a square, they note that they both are closed figures, have straight sides, but the triangle has 3 sides while the square has 4. Or, when building in the Block Center, they notice that the faces on the cube are all square shapes. Kindergarteners also distinguish between the most typical examples of a shape from obvious non-examples. For example: When identifying the triangles from a collection of shapes, a student circles all of the triangle examples from the non-examples. 
ESSENTIAL QUESTION(S)	How can I describe a shape? How are these shapes the same or different? Why are these shapes the same or different?
MATHEMATICAL PRACTICE(S)	K.MP.6. Attend to precision. K.MP.7. Look for and make use of structure.
DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4

Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Identify attributes of shapes. Describe attributes of a variety of two- and three-dimensional shapes.	Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, describing their similarities, differences, and other attributes.	

EXPLANATIONS AND EXAMPLES

Students analyze and compare two- and three-dimensional shapes by observations. Their visual thinking enables them to determine if things are alike or different based on the appearance of the shape. Students sort objects based on appearance. Even in early explorations of geometric properties, they are introduced to how categories of shapes are subsumed within other categories. For instance, they will recognize that a square is a special type of rectangle.

Students should be exposed to triangles, rectangles, and hexagons whose sides are not all congruent. They first begin to describe these shapes using everyday language and then refine their vocabulary to include sides and vertices/corners. Opportunities to work with pictorial representations, concrete objects, as well as technology helps student develop their understanding and descriptive vocabulary for both two- and three- dimensional shapes.

STANDARD AND DECONSTRUCTION

K.G.5	**Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.**		
DESCRIPTION	Students apply their understanding of geometric attributes of shapes in order to create given shapes. For example, students may roll a clump of play-doh into a sphere or use their finger to draw a triangle in the sand table, recalling various attributes in order to create that particular shape.		
ESSENTIAL QUESTION(S)	How can I show what a shape looks like?		
MATHEMATICAL PRACTICE(S)	K.MP.1. Make sense of problems and persevere in solving them. K.MP.4. Model with mathematics. K.MP.7. Look for and make use of structure.		
DOK Range Target for Instruction & Assessment	☒ 1 ☒ 2 ☐ 3 ☐ 4		
Learning Expectations	**Know: Concepts/Skills**	**Think**	**Do**
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:	Recognize and identify basic shapes in the real world.		Draw shapes found in the environment. Construct shapes from components (e.g., sticks and clay balls).
EXPLANATIONS AND EXAMPLES	Because two-dimensional shapes are flat and three-dimensional shapes are solid, students should draw two-dimensional shapes and build three-dimensional shapes. Shapes may be built using materials such as clay, toothpicks, marshmallows, gumdrops, straws, etc.		

STANDARD AND DECONSTRUCTION

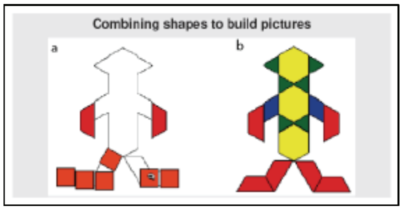
K.G.6 Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"

DESCRIPTION

This standard moves beyond identifying and classifying simple shapes to manipulating two or more shapes to create a new shape. This concept begins to develop as students move, rotate, flip, and arrange puzzle pieces to complete a puzzle. Kindergarteners use their experiences with puzzles to use simple shapes to create different shapes.

For example, when using basic shapes to create a picture, a student flips and turns triangles to make a rectangular house.

Students also combine shapes to build pictures. They first use trial and error (part a) and gradually consider components (part b).



ESSENTIAL QUESTION(S)

How do smaller shapes make a bigger shape?

Why did these smaller shapes make this bigger shape?

MATHEMATICAL PRACTICE(S)

K.MP.1. Make sense of problems and persevere in solving them.

K.MP.3. Construct viable arguments and critique the reasoning of others.

K.MP.4. Model with mathematics.

KP.7. Look for and make use of structure.

DOK Range Target for Instruction & Assessment

☒ 1 ☒ 2 ☐ 3 ☐ 4

Learning Expectations	Know: Concepts/Skills	Think	Do
Assessment Types	Tasks assessing concepts, skills, and procedures.	Tasks assessing expressing mathematical reasoning.	Tasks assessing modeling/applications.
Students should be able to:		Analyze how to put simple shapes together to compose a new or larger shape.	Compose a new or larger shape using more than one simple shape.

EXPLANATIONS AND EXAMPLES

Students use pattern blocks, tiles, or paper shapes and technology to make new two- and three-dimensional shapes. Their investigations allow them to determine what kinds of shapes they can join to create new shapes. They answer questions such as, "What shapes can you use to make a square, rectangle, circle, triangle? …etc."

Students may use a document camera to display shapes they have composed from other shapes. They may also use an interactive whiteboard to copy shapes and compose new shapes. They should describe and name the new shape.

GEOMETRY

The COMMON CORE Institute

COMMON CORE State Standards

DECONSTRUCTED for CLASSROOM IMPACT