CCGPS Frameworks Student Edition

Mathematics

Kindergarten Unit Two
Building Number

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"Making Education Work for All Georgians"

Unit 2: Building Numbers

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The Critical Areas are designed to bring focus to the standards at each grade by describing the big ideas that educators can use to build their curriculum and to guide instruction.

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.

OVERVIEW

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

For numbers 11 to19, Kindergarten students choose, combine, and apply strategies for answering quantitative questions. This includes composing and decomposing numbers from 11 to 19 into ten ones and some further ones by writing and representing the numbers, 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 CCGPS 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: it is not until First Grade that "Understand the meaning of the equal sign" is an expectation.

Mathematically proficient students might rely on using concrete objects or pictures to help conceptualize and solve a problem. While using objects to make sense of the quantities and relationships in problem situations, students thereby connect whether the answer makes sense through comparisons and discussions. Using the mathematical language to verbalize their reasoning is an important cognitive facet for establishing a strong place value foundation. The terms students should continue to use as they verbalize thinking are: **join, add, separate, subtract, same amount as, equal, less, more, tens, & ones.**

STANDARDS FOR MATHEMATICAL CONTENT

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

MCCK.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.

MCCK.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).

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
> 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.

MCCK.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.

MCCK.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.

MCCK.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

MCCK.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

STANDARDS FOR MATHEMATICAL PRACTICE

The standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education.
Students are expected to:
> 1. Make sense of problems and persevere in solving them.
> 2. Reason abstractly and quantitatively.
> 3. Construct viable arguments and critique the reasoning of others.
> 4. Model with mathematics.
> 5. Use appropriate tools strategically.
> 6. Attend to precision.
> 7. Look for and make use of structure.
> 8. Look for and express regularity in repeated reasoning.
> *****Mathematical Practices 1 and 6 should be evident in EVERY lesson*****

ENDURING UNDERSTANDINGS

- A number's place affects its value.
- Counting tells how many things are in a set.
- The last number word, when counting, names the quantity for that set.
- Counting objects in a different order does not change the quantity.
- Each successive number name refers to a quantity that is one larger.
- A number can be represented by a set of objects and then by a numeral.
- Sets of objects can be compared to determine more than, fewer than or equal.
- Numbers are related to each other through a variety of number relationships. For example, 6 is one more than 5 and 4 less than 10, is composed of 3 and 3 as well as 4 and 2, and can be recognized quickly in patterned arrangements of dots.
- The numbers 5 and 10 are benchmark numbers. (Is a number closer to 5 or 10? How close?)

ESSENTIAL QUESTIONS

- Why wouldn't you count a dot more than once?
- Why would I need to be able to read number words?
- Why is counting very important?
- Why do we sort objects into groups?
- Why do we need to be able to count forwards and backwards?
- Why do I need to be able to count objects?
- When do we use counting skills in everyday life?
- What is the difference between a group of ten and the leftovers?
- What is an efficient way to count an amount greater than ten?
- What is an efficient strategy for counting teen numbers?
- What happens when we cannot make an even group?
- What did you notice about the numbers and the number of leftovers?
- How might you recognize the number of dots on a card without counting? (pattern)
- How many things does your partner have in his/her cup?
- How many things are in your cup?
- How do you know which side of the domino is more?
- How do you know which side of the domino is less?
- How do you know if you have more or less than your partner?
- How do we use numbers every day?
- How do we use counting in our everyday life?
- How did you know how many counters to put with the More Card?
- How did you know how many counters to put with the Less Card?
- How did you count the dots?
- How can you know a quantity without counting each object?
- How can you explain how one end of a domino connects to another?
- How can we use counting in our everyday life?

- How can numbers be represented?

CONCEPTS AND SKILLS TO MAINTAIN

Although many students may have attended pre-school prior to entering kindergarten, this is the first year of school for some students. For that reason, no concepts/skills to maintain will be listed at this time. It is expected that teachers will differentiate to accommodate those students who may enter kindergarten with prior knowledge.

SELECTED TERMS AND SYMBOLS

The following terms and symbols are often misunderstood. These concepts are not an inclusive list and should not be taught in isolation. However, due to evidence of frequent difficulty and misunderstanding associated with these concepts, instructors should pay particular attention to them and how their students are able to explain and apply them.

The terms below are for **teacher reference only and are not to be memorized by students**. Teachers should present these concepts to students with models and real life examples. Students should understand the concepts involved and be able to recognize and/or demonstrate them with words, models, pictures, or numbers.

- **Combine**
- **Count**
- **Digits**
- **Efficient**
- **Equal**
- **Estimate**
- **Greater**
- **Less**
- **More**

STRATEGIES FOR TEACHING AND LEARNING

Kindergarteners need to understand the idea of *a ten* so they can develop the strategy of adding onto 10 to add within 20 in Grade 1. Students need to construct their own base-ten ideas about quantities and their symbols by connecting to counting by ones. They should use a variety of manipulatives to model and connect equivalent representations for the numbers 11 to19. For instance, to represent 13, students can count by ones and show 13 beans. They can anchor to five and show one group of 5 beans and 8 beans or anchor to ten and show one group of 10 beans and 3 beans. Students need to eventually see *a ten* as different from 10 ones.

After the students are familiar with counting up to 19 objects by ones, have them explore different ways to group the objects that will make counting easier. Have them estimate before they count and group. Discuss their groupings and lead students to conclude that grouping by ten is desirable. "*10 ones make 1 ten*" makes students wonder how something that means a lot of things can be one thing. They do not see that there are 10 single objects represented on the item for ten in pre-grouped materials, such as the rod in base-ten blocks. Students then attach words to materials and groups without knowing what they represent. Eventually they need to see the rod as *a ten* that they did not group themselves. Students need to first use materials that can be grouped to represent numbers 11 to 19 because a group of ten such as a bundle of 10 straws or a cup of 10 beans makes more sense than *a ten* in pre-grouped materials.

Kindergarteners should use proportional base-ten models, where a group of ten is physically 10 times larger than the model for a one. Non-proportional models such as an abacus and money should not be used at this grade level if students have a tenuous understanding of models for ten. Proceed with caution with coin-based activities. Wait, if necessary, and revisit later in the year.
Students should impose their base-ten concepts on a model made from groupable and pre-groupable materials (see resources/tools). Students can transition from groupable to pre-groupable materials by leaving a group of ten intact to be reused as a pre-grouped item. When using pre-grouped materials, students should reflect on the ten-to-one relationships in the materials, such as the "ten-ness" of the rod in base-ten blocks. After many experiences with pre-grouped materials, students can use dots and a stick (one tally mark) to record singles and a ten, then move to experiences with pennies and dimes.

COMMON MISCONCEPTIONS

Some students might not see zero as a number. Ask students to write 0 and say *zero* to represent the number of items left when all items have been taken away. Avoid using the word *none* to represent this situation.

Some students might think that the count word used to tag an item is permanently connected to that item. So when the item is used again for counting and should be tagged with a different count word, the student uses the original count word. For example, a student counts four geometric figures: triangle, square, circle and rectangle with the count words: one, two, three, four. If these items are rearranged as rectangle, triangle, circle and square and counted, the student says these count words: four, one, three, two.

Students may over-generalize the vocabulary in word problems and think that certain words indicate solution strategies that must be used to find an answer. They might think that the word *more* always means to add and the words *take away* or *left* always means to subtract. When students use the words *take away* to refer to subtraction and its symbol, repeat students' ideas using the words *minus* or *subtract*. For example, students use addition to solve this Take From/Start Unknown problem: Seth took the 8 stickers he no longer wanted and gave them to Anna. Now Seth has 11 stickers *left*. How many stickers did Seth have to begin with?

If students progress from working with manipulatives to writing numerical expressions and equations, they skip using pictorial thinking. Students will then be more likely to use finger counting and rote memorization for work with addition and subtraction. Counting forward builds to the concept of addition while counting back leads to the concept of subtraction. However, counting is an inefficient strategy. Provide instructional experiences so that students progress from the concrete level to the pictorial level to the abstract level.

Students have difficulty with *ten* as a singular word that means 10 things. For many students, the idea that a group of 10 things can be replaced by a single object and both objects represent 10 is confusing. Help students develop the sense of 10 by first using groupable materials then replacing the group with an object or representing 10. Watch for and address the issue of attaching words to materials and groups without knowing what they represent. If this misconception is not addressed early on it can cause additional issues when working with numbers 11-19 and beyond.

EVIDENCE OF LEARNING

By the conclusion of this unit, students should be able to demonstrate the following competencies:

- Count one-to-one in counting order at least to 20
- Count a number of objects up to 20
- After counting, verbally tell the amount in a set
- Match number words to sets of objects
- Label sets to 20
- Recognize numerals to 20
- Rote count to 20
- Count on from a number of objects
- Estimate a quantity (and tell if it is closer to five or ten) using five- and ten-strips
- Recognize quantities of objects 1 to 20 and their relationship to 10
- Group objects by 5's and 10's
- Give examples of number relationships such as fourteen is 10 ones and 4 more
- Compare sets of objects to determine more than, fewer than or equal
- Compare two numbers between 1 and 10 presented as written numerals

SCAFFOLDING TASK	CONSTRUCTING TASK	PRACTICE TASK	PERFORMANCE TASK
Tasks that build up to the constructing task.	Constructing understanding through deep/rich contextualized problem solving tasks	Games/activities	Summative assessment for the unit

TASKS

The following tasks represent the level of depth, rigor, and complexity expected of all Kindergarteners. These tasks or a task of similar depth and rigor should be used to demonstrate evidence of learning.

Task Name	Task Type/ *Grouping Strategy*	Content Addressed
Got Dots Revisited (11-20)	Scaffolding Task *Whole/Small Group Partner/Individual*	Number relationships, Comparing sets, One to one correspondence
Numeral, Picture, Word (11-20)	Scaffolding Task *Whole/Small Group Partner/Individual*	Counting, Numeral recognition, Number relationships, Recognizing number words
"Teen" Frame Talk About (11-12)	Constructing Task *Whole Group/Partner*	Number relationships
"Teen" Frame Talk About (13-19)	Constructing Task *Whole Group/Partner*	Number relationships
Counting Cup	Practice Task *Small Group or Partner*	Estimating and one to one correspondence
The Cardinal Cup (revisited 11-19)	Constructing Task *Whole Group/partner*	Counting and number sequence
Make Sets of Less/Same/More	Scaffolding Task *Small Group/Individual*	Counting, Numeral recognition, Number relationships, Recognizing number words
One More/Less Than Dominos	Scaffolding Task *Small Group/Individual*	Comparing sets, Number relationships
Riddle Me This	Constructing Task *Whole Group/Partner*	Number relationship, Comparing sets
Moving a Cup of 10	Constructing Task *Partner*	Counting, One to one correspondence, Unitizing
Make a 10 and Carry On	Constructing Task *Whole Group/Partner*	Counting, Unitizing
Race to 100 Pennies(revisited)	Constructing Task *Whole Group/Partner*	Counting, One to one correspondence, Skip counting, Unitizing
10 and Some More	Performance Task *Small Group/Individual*	Counting, One to one correspondence, Number relationships, Comparing sets

As this unit has no Culminating Task, you may pair/modify tasks to include all unit standards in combination.

SCAFFOLDING TASK: Got Dots Revisited (11-20)

Approximately one day. This task contains numerous activities where students engage in activities. This task introduces students to numbers that are greater than 10.

STANDARDS FOR MATHEMATICAL CONTENT

MCCK.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.

MCCK.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.

MCCK.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Many good number development activities involve multiple ways for students to identify number relationships. As children learn about ten-frames, patterned sets, and other relationships, dot cards provide a wealth of activities that allow students to develop their number sense. When students use these dot cards for almost any activity that involves number concepts, the cards make them think about numbers in many different ways. (Van de Walle, p.53)

ESSENTIAL QUESTIONS

- Why is counting very important?
- When do we use counting skills in everyday life?
- How can you know a quantity without counting each object?

MATERIALS

- Dot cards (printing multiple sets of cards on tag board and laminating is recommended)

GROUPING

Whole group and partner task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

The following dots card activities can be introduced as a whole class and then repeated throughout the year through small group and stations/centers. Kindergarten students are extremely creative and continuously invent new games. Have students create a game using the cards and share with classmates.

- **Got Dots:** Many of the suggested activities for *Got Dots?* in unit 1can be used with *Got Dots Revisited.* The only difference is that the dot cards used in this activity are for numbers 11-20.

- **Before and After:** Cards are placed in a pile, face down. One player turns over the top card and the other player must the state the number that comes after that number, and the number that comes before. If the student is able to correctly identify all 3 numbers they keep the card. If they are unable to the card is placed at the bottom of the pile. The player with the most cards once no more cards are in the pile wins. *This game can be modified so that students can count two forward/backwards.*

- **Back to 10:** Cards are placed in a pile, face down. One player turns over the top card and the other player counts backwards to 10 from the number on the card. (*Example: if 16 was flipped over the student would count backwards from 16 to 10).*

Comment: As students practice backwards counting sequence, observe which students need to count forward to count backwards. *(Example: If a student flipped the 16 card, notice whether they need to count forward from a given number to identify that 15 comes before 16)*

- **Counting to Anchors:** Cards are placed in a pile face down. One player turns over the top card and states whether the number is closer to 10 or 20. The students must justify their reasoning. (*Example: I have 16 and I know that 16 is closer to 20 because 15 is halfway to 20 and 16 is more than 15).* Then, starting at the number card the student must count aloud to the nearest anchor. If the student is correct in their counting sequence they collect the number card. *Students can use a 0-99 chart as an intervention to assist with the forward and backward counting sequence.*

- **Dot-Card Train:** Make a long row of dot cards from 11-19

  Van de Walle's *Teaching Student Centered Mathematics K-3* lists numerous ways to incorporate subitizing activities into the classroom.
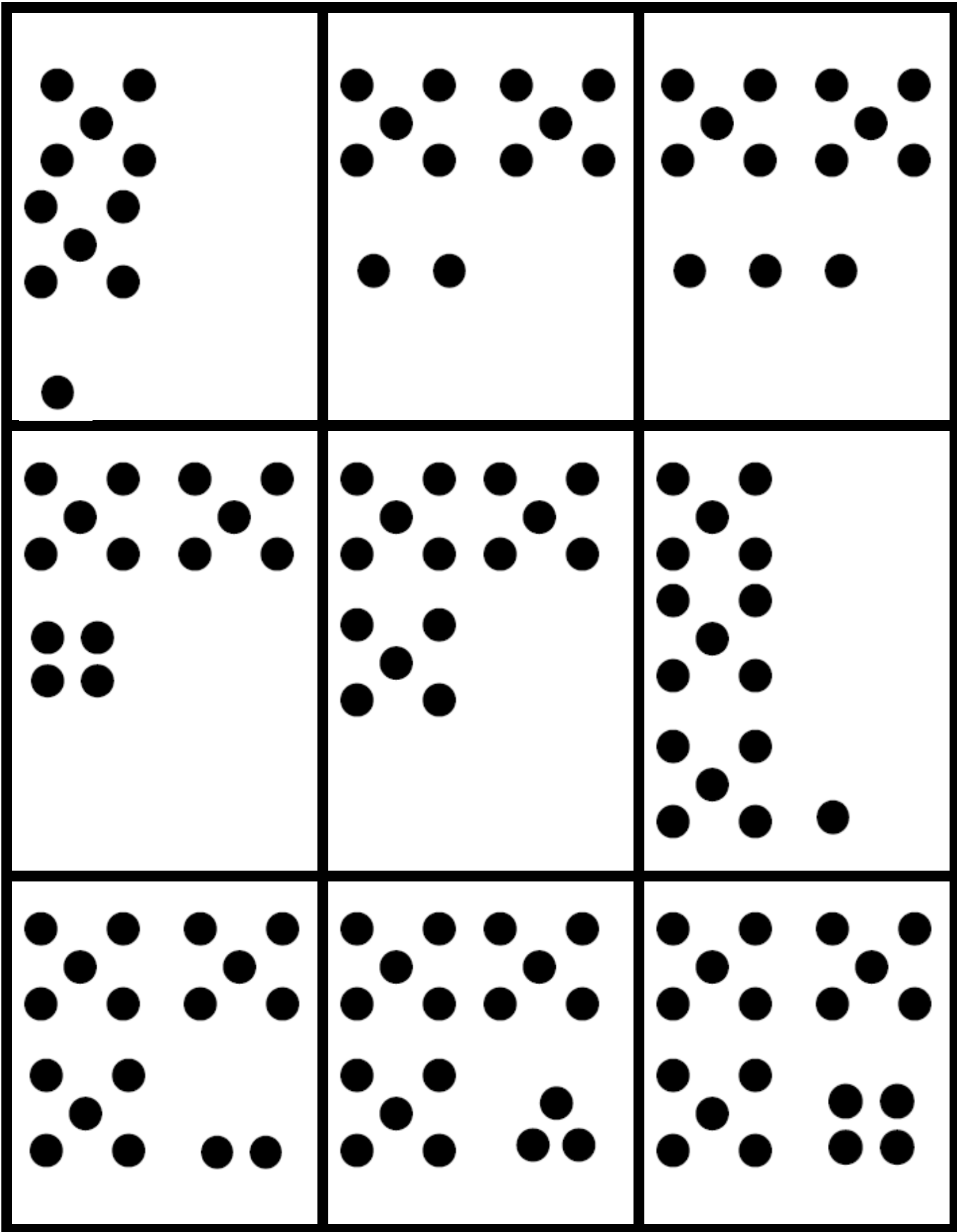
FORMATIVE ASSESSMENT QUESTIONS

- How do you know that you counted correctly?
- How many dots did you see?
- How do you know?
- What way did you see the dots grouped together?
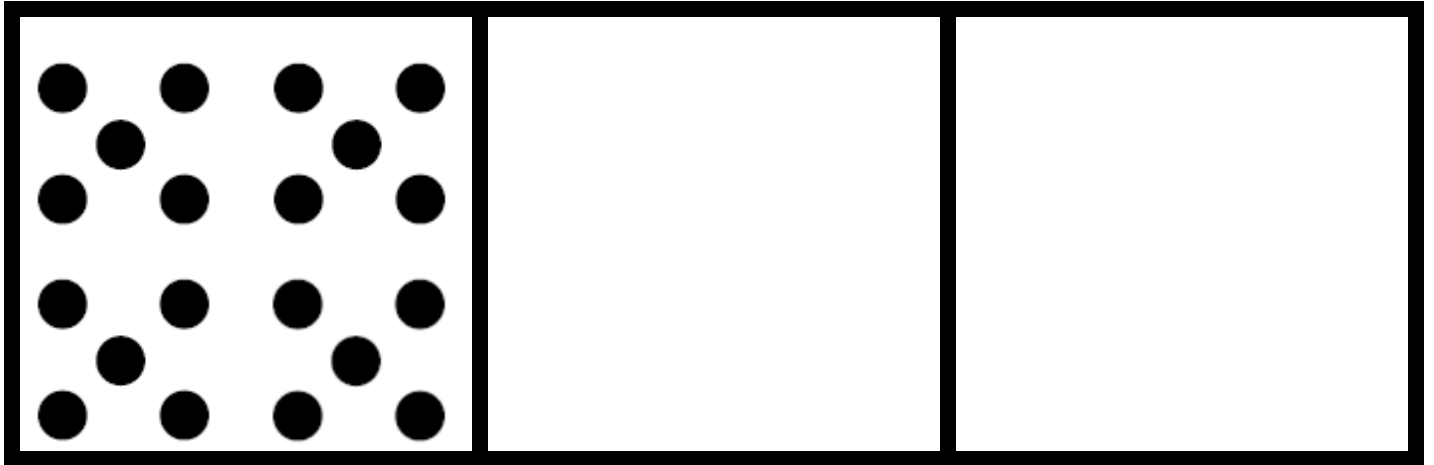- How many dots is 12 from 10? How many dots would you need to make 20? 25? (anchoring 5&10)

DIFFERENTIATION

Extension and Intervention
- Increasing or decreasing the quantity of dots on a card can help with differentiating subitizing activities.

SCAFFOLDING TASK: Numerals-Pictures-Words (11-19)

STANDARDS FOR MATHEMATICAL CONTENT

MCC.K.CC.1. Count to 100 by ones and by tens.

MCC.K.CC.2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

MCC.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).

MCC.K.CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality.
   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.
   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.
   c. Understand that each successive number name refers to a quantity that is one larger.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE
Students need to understand that quantity can be represented through numerals, pictures, and words. Students should be given ample time to explore this concept early on in kindergarten. These task cards are designed for students to see and recognize the different forms in which a quantity can be represented.

ESSENTIAL QUESTIONS

•   How can we use counting in our everyday life?

- How can numbers be represented?

MATERIALS

- Numerals, Pictures, Words playing cards

GROUPING

Whole group, small group, partner, individual

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Concentration/Memory: Shuffle the cards and lay them face down in a pattern. Let students decide the pattern but they need to be able to explain their pattern. On each turn, a player turns over two cards (one at a time). If the amount represented on each card matches the player keeps the cards. If a match is made the player gets another turn. When a player turns over two cards that do not match, those cards are then turned face down again and it becomes the next player's turn. Each pair matched is worth one point. When all possible cards have been matched, the player with the most points wins.

Squeeze: Cards are placed face down in a stack on the table. The first player takes two cards and places them face up on the table with a space between them and in order from smallest to largest. The second player does the same. Then, they turn up the top card in the pile. If this card squeezes between the two cards, that player gets a point. If Player 1 has "12" and "15" and Player 2 has "14" and "19" and a "13" is flipped over, only Player 1 gets a point because "13" fits between their numbers. Keep score on a ten-frame. First player to 10 wins.

Got Dots: The subitizing activities listed in *Got Dots* can also be included and played with the *Numeral, Picture, Word Cards.*

Suggested questions used to engage students:
- How do you know that you counted correctly?
- How many dots did you see? How do you know?
- What way did you see the dots grouped together?
- How many dots are 8 from 5? How many dots would you need to make 10? (anchoring 5&10)
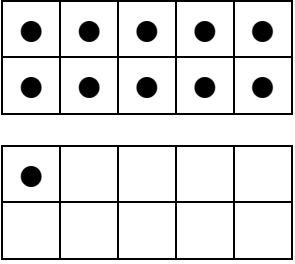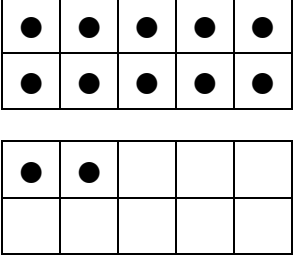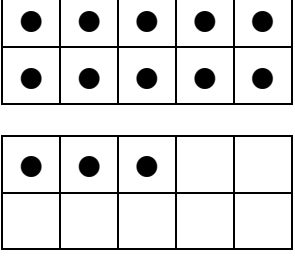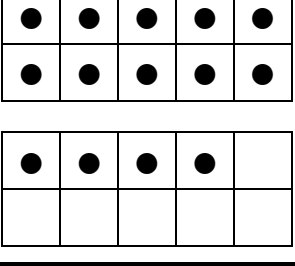
FORMATIVE ASSESSMENT QUESTIONS
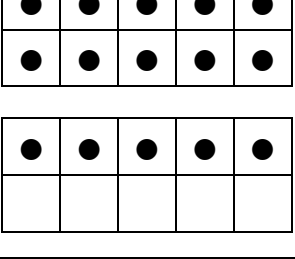
- Is the number closer to 10 or 20? How do you know?
- Can you make a group of ten with the number _____?
- If you removed the group of ten, what number would you have?
- How many dots would you need to make a second group of ten?
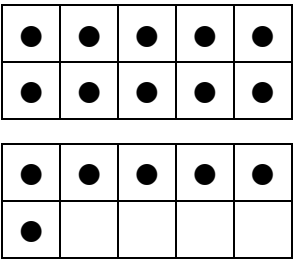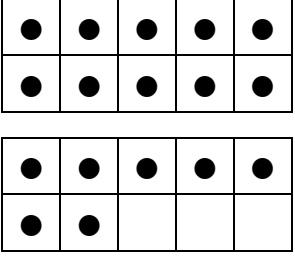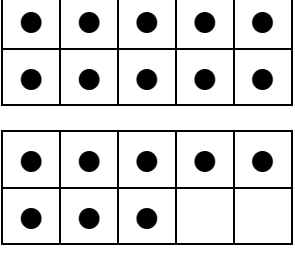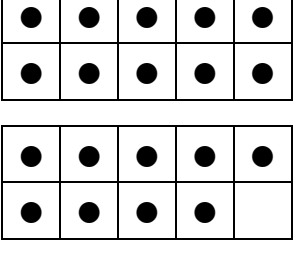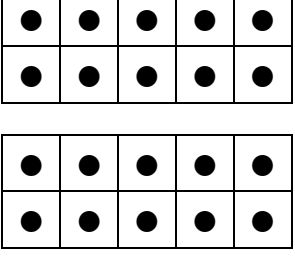
DIFFERENTIATION

Extension and Intervention
- Increasing or decreasing the quantity of dots on a card can help with differentiating subitizing activities.

11	a group of 10 and 1 more	
12	a group of 10 and 2 more	
13	a group of 10 and 3 more	
14	a group of 10 and 4 more	
15	a group of 10 and 5 more	

16	a group of 10 and 6 more	(ten frame showing 10 dots, and a ten frame showing 6 dots)
17	a group of 10 and 7 more	(ten frame showing 10 dots, and a ten frame showing 7 dots)
18	a group of 10 and 8 more	(ten frame showing 10 dots, and a ten frame showing 8 dots)
19	a group of 10 and 9 more	(ten frame showing 10 dots, and a ten frame showing 9 dots)
20	a group of 10 and 10 more	(ten frame showing 10 dots, and a ten frame showing 10 dots)

CONSTRUCTING TASK: "Teen" Frame Talk-About (11-12)

Approximately 1 day

STANDARDS FOR MATHEMATICAL CONTENT

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

MCCK.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.

MCCK.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).

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
   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.

MCCK.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.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEGDE

A set of ten should play a major role in children's initial understanding of numbers between 10 and 20. When children see a set of six with a set of ten, they should know without counting that the total is 16. However, the numbers between 10 and 20 are not an appropriate place to discuss place-value concepts (in kindergarten) children should not be asked to explain the 1 in 16 as

representing "one ten." The concept of a single ten is just too strange for a kindergarten or early first-grade child to grasp. (Van de Walle, 2006 p. 54)

ESSENTIAL QUESTIONS

- What is an efficient strategy for counting teen numbers?

MATERIALS

- Connecting cubes

GROUPING

Whole group/Individual/Pairs

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Comment: The purpose of this task is for students to explore double-ten frames and to build the understanding of how to make a ten before moving into the teen numbers.

Preparing for "*Teen-Frame Talk About*": on 2 pieces of chart paper, glue one blank double ten-frame to record your students' thinking for the numbers 11 and 12.

Bring students to a gathering place to explore numbers as a learning community where all ideas are accepted and discussed. The purpose of this task is for students to explore the numbers 11 and 12 and realize that the most efficient way count numbers greater than 10 is to make a group of ten and count on.

Give each student a pile of multicolored, unconnected connecting cubes (more than ten, no more than 20). Ask the students to estimate how many they have in their pile and how they came up with their estimation. Have students count to determine the total amount.

Show students the numeral "11" and ask them to count out 11 cubes. Discuss the number 11 and have students share what they know about the number 11. After time has been given to the discussion, ask students to build a tower of 11 cubes. (Again make sure the tower is composed of multicolored cubes). Ask the students to justify/prove the tower is 11 without counting out each individual cube. Take suggestions and allow for the conversation to continue as students share what makes counting difficult and record suggestions.

After sharing thoughts about the number 11, show the students the numeral "12". Ask students to make a tower of 12 and repeat the same sequence of questions that were posed for the number 11. Observe which students add 1 cube, which students keep the tower and start counting from 1 to 11 and then add one more, and which students decompose their tower to individual cubes and

build up from 1. Allow students to share their strategies for making a tower of 12. Identify the most efficient strategy.
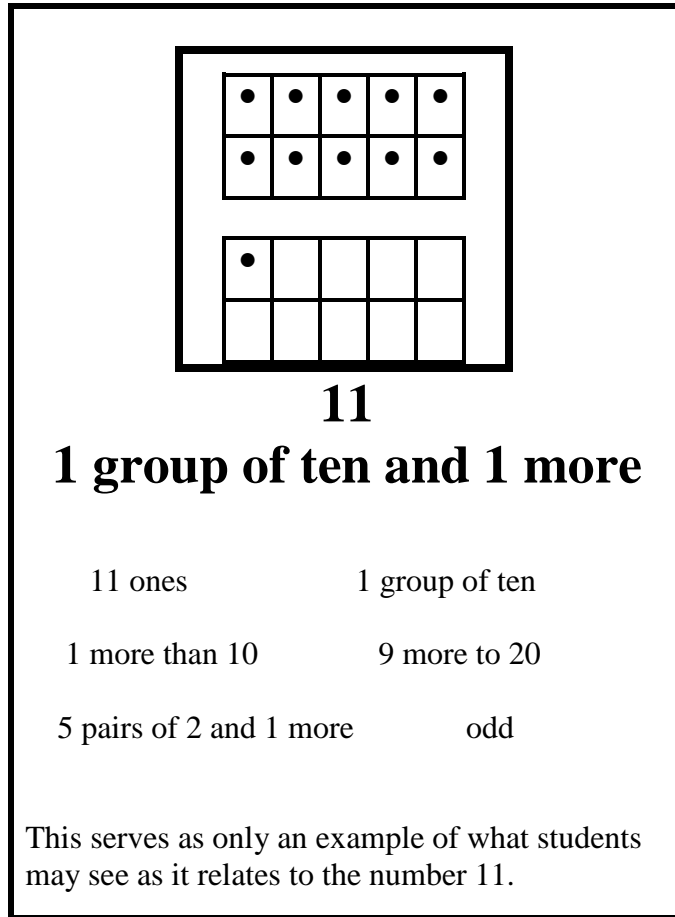
After students share what they know about the number 12, group the students on the floor in pairs and give each pair (2) double ten-frame mats. Have one partner build 11 and the other 12 on the ten-frame mat. Partners should explore and discuss what each number looks like on the double ten-frame and compare both numbers to one another. Some students may not fill a ten-frame first before moving on to the second one. Do not discourage students from building numbers differently. Allow students to share the ways they made 11 and 12 on their ten-frame. Ask the students to explain how they know they have 11 or 12 without counting individual cubes. Focus on the students that made a ten first and have those students model this representation of the numbers 11 and 12.

Here the students will say that they know they have a group of 10 and 1 more. **EMBRACE THIS CONCEPT!!!!** Remind students what made counting the tower of 11 and 12 difficult (multicolored cubes). Guide students to see that if cubes were only 2 colors, counting would be much more efficient. Students need to see that using one color to make a tower of 10 and the other color to make "some more" is more efficient than counting the cubes 1 by 1. Tell students that tomorrow they will only get two colors. Again, this needs to appear to be a student, NOT TEACHER, invented strategy. After student have explored the numbers 11 and 12 on the ten frames and through building towers, allow the students to model 11 and 12 using the Rekenreks built in unit 1.

Comment: it is critical that students see the group of ten and not just focus on the color. The students need to recognize that using two colors to differentiate tens and ones is an efficient strategy. In addition students need to understand that making a group of tens first and seeing what "ones" are left over to identify/compose a number is the most efficient strategy?

Draw student focus to the chart paper and double ten-frame created before the lesson. Students should still have the numbers 11 and 12 built on the ten-frames. Have students share what they know about each number and record on the chart paper. Have a student represent the numbers 11 and 12 on the ten-frame by coloring dots. Discuss the most efficient way to represent the numbers on a ten frame (make a 10 first).

Below is a sample of what a *"Teen-Frame Talk About"* anchor chart could look like.

11
1 group of ten and 1 more

11 ones	1 group of ten
1 more than 10	9 more to 20
5 pairs of 2 and 1 more	odd

This serves as only an example of what students may see as it relates to the number 11.

Because students in kindergarten have difficulty with the "teen" numbers, post this anchor chart in the classroom for the remainder of the year. Leave extra space on the chart so that as new concepts and relationship are discovered throughout the year they can added to the chart.

FORMATIVE ASSESSMENT QUESTIONS

- How many groups do you have?
- How many extras?
- How many cubes altogether?
- What number would come next?

DIFFERENTIATION

Extension
- Stars- students work with a partner. Using a 1-minute sand timer, a partner will time the other students to make as many stars (or other easily drawn shape) as s/he can in one

minute. When s/he's finished, the other partner will count the stars and describe how they counted (did they circle groups of ten first?)

- "Pinch a Ten". Using a bag of kidney beans (popcorn kernels, lima beans, etc.), students will take a "pinch" of kidney beans and count. Did your pinch have fewer than ten, more than ten, or exactly ten? Make a chart similar to the one below:

Fewer than 10	10	More than 10
*Students record their pinches using tally marks		

Intervention
- For students who have difficulty with organization, offer them a ten frame to use to organize their cubes before connecting them.

SCAFFOLDING TASK: "Teen" Frame Talk-About Continued (13-19)

Approximately 3 days

STANDARDS FOR MATHEMATICAL CONTENT

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

MCCK.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.

MCCK.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).

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
> b.   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.

MCCK.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.

MCCK.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.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEGDE

A set of ten should play a major role in children's initial understanding of numbers between 10 and 20. When children see a set of six with a set of ten, they should know without counting that the total is 16. However, the numbers between 10 and 20 are not an appropriate place to discuss place-value concepts (in kindergarten), children should not be asked to explain the 1 in 16 as representing "one ten. The concept of a single ten is just too strange for a kindergarten or early first-grade child to grasp. (Van de Walle, 2006 p. 54)

ESSENTIAL QUESTIONS

- What is an efficient strategy for counting numbers in the teens?

MATERIALS

- Connecting cubes (2 colors-10 each)
- Double 10-frame

GROUPING

Whole and Individual/Pairs

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

This lesson should be repeated for the following days
Day 1 (13,14)
Day 2 (15,16,17)
Day 3 (18,19, 20)

To prepare for "*Teen-Frame Talk About*": On 2 pieces of chart paper, glue one blank double ten-frame to record your students' thinking for the numbers 13 and 14.

Bring students to a gathering place to explore numbers as a learning community where all ideas are accepted and discussed. The purpose of this task is for students to explore the numbers 13 and 14 and realize that the most efficient way count numbers greater than 10 it is to make a ten and count on.

Give each student a pile of multicolored, unconnected connecting cubes. Students will remind you that you need only 2 colors(10 of each). This is an opportunity to review why making a ten is an efficient way to count numbers greater than 10. Give each student a pile with only 2 colored cubes, with at least 10 cubes of each color.

Show students the numeral "13" and ask them to count out 13 cubes. Discuss the number 13 and have students share what they know about the number 13. After time has been given to the discussion, ask students to build a tower of 13 cubes. Monitor the students who make a tower of ten first with one color and count beyond 10 with another color. Ask the students to

justify/prove the tower is 13 without counting out each individual cube. Take suggestions and allow for the conversation to continue as students share what makes counting difficult and record suggestions.
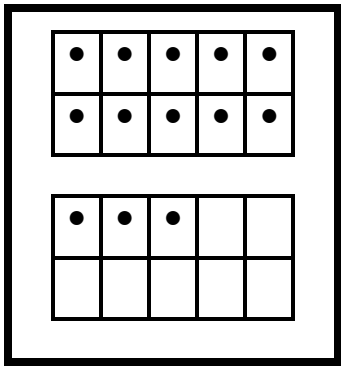
After sharing thoughts about the number 13, show the students the numeral "14". Ask students to make a tower of 14 and repeat the same sequence of questions that were posed for the number 13. Observe which students add 1 cube, the students that keep the tower together and start counting from 1 to 14 and then add one more, and the students that decompose their tower to individual cubes and build up from 1. Allow students to share their strategies for making a tower of 14. Identify the most efficient strategy.

After students share what they know about the number 14, group the students on the floor in pairs and give each pair (2) double ten-frame mats. Have one partner build 13 and the other 14 on the ten-frame mat. Partners should explore and discuss what each number looks like on the double ten-frame and compare both numbers to one another. Some students may not fill a ten-frame first before moving on to the second one. Do not discourage students from building numbers differently. Allow students to share the ways the made 13 and 14 on their ten-frame. Ask the students how they know they have 13 or 14 without counting individual cubes. Focus on the students that made a ten first and have students model this representation of the numbers 13 and 14. After student have explored the numbers 13 and 14 on the ten frame and through building towers, allow the students to model 13 and 14 using the Rekenreks built in unit 2.

Comment: it is critical that students see the group of ten and not just focus on the color. The students need to recognize that using two colors to differentiate tens and ones is an efficient strategy. In addition students need to the students need to understand that making a group of tens first and seeing what "ones" are left over to identify/compose a number is the most efficient strategy?

Draw students focus to the chart paper and double ten-frame created before the lesson. Students should still have the numbers 13 and 14 built on the ten-frames. Have students share what they know about each number and record on the chart paper. Have a student represent the numbers 13 and 14 on the ten-frame by coloring dots. Discuss the most efficient way to represent the numbers on a ten frame (make a 10 first).

Below is a sample of what a *"Teen-Frame Talk About"* anchor chart could look like.

13   Thirteen
1 ten and 3 more

13 ones	1 group of ten
3 more than 10	7 more to 20
5 pairs of 2 and 3 more	odd
1 more than 12	1 less than 14

This serves as only an example of what students may see as it relates to the number 13.

Because students in kindergarten have difficulty with the "teen" numbers, post this anchor chart in the classroom for the remainder of the year. Leave extra space on the chart so that as new concepts and relationship are discovered throughout the year, they can be listed on the chart.

FORMATIVE ASSESSMENT QUESTIONS
- How many groups do you have?
- How many extras?
- How many cubes altogether?

DIFFERENTIATION

Extension
- Stars- students work with a partner. Using a 1-minute sand timer, a partner will time the other students to make as many stars (or other easily drawn shape) as s/he can in one

minute. When s/he's finished, the other partner will count the stars and describe how they counted (did they circle groups of ten first?)
- "Pinch a Ten". Using a bag of kidney beans (popcorn kernels, lima beans, etc.), students will take a "pinch" of kidney beans and count. Did your pinch have fewer than ten, more than ten, or exactly ten? Make a chart similar to the one below:

Fewer than 10	10	More than 10
*Students record their pinches using tally marks		

Intervention
- For students who have difficulty with organization, offer them a ten frame to use to organize their cubes before connecting them.

PRACTICE TASK: Counting Cup

Approximately one day, but this lesson is designed to be repeated as students become ready for numbers up to 20. So, the first experience with the Counting Cup could have counters up to 12. The second experience with the Counting Cup could have numbers up to 14, etc. (Adapted from K-5 Math Teaching Resources.com)

STANDARDS FOR MATHEMATICAL CONTENT

MCCK.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.

MCCK.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).

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
   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.

MCCK.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.

MCCK.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.

MCCK.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

MCCK.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEGDE

This task focuses on counting and communicating quantities up to 20. Note: Use items that are all the same in the cup (i.e. all counters, all bears, all beans, etc.). After the students are familiar with counting up to 20 objects by ones, have them explore different ways to group the objects that will make counting easier. Have them estimate before they count and group. Discuss their groupings and lead students to conclude that grouping by ten is desirable. *10 ones make 1 ten* makes students wonder how something that means a lot of things can be one thing. They do not see that there are 10 single objects represented on the item for ten in pre-grouped materials, such as the rod in base-ten blocks. Students then attach words to materials and groups without knowing what they represent. Eventually, they need to see the rod as *a ten* that they did not group themselves. Students need to first use materials that can be grouped together to represent numbers 11 to 19 because a group of ten such as a bundle of 10 straws, or a cup of 10 beans, makes more sense than *a ten* in pre-grouped materials.

ESSENTIAL QUESTIONS

- How many things are in your cup?
- How many things does your partner have in his/her cup?
- How do you know if you have more or less than your partner?

MATERIALS

- Paper/plastic cups with 10-19 counters in each cup.
- 12 Counters for each child (or items with likeness) with an increase each time the Counting Cup is used.
- *The Counting Cup* recording sheet

GROUPING

Partner

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Place different quantities of objects into cups in a central location of the classroom. There should be at least 1 cup per student but having more is encouraged so that students do not have to wait for their next cup to become available. Label each cup with a different letter of the alphabet. Gather the students together to model how to use the Counting Cups.

Using one cup, model the task for students by tipping out the objects in the Counting Cup. Once the cup is poured out, have the students make estimations as to how many counters were in the

cup. What an estimate is and strategies for how to make appropriate estimations may need to be reviewed. Have the students explain their strategy for estimating that number. Show students where to record their estimate using the recording sheet.

After making an estimate, have the students count the counters as they lie, <u>without moving them.</u> The counters may be touched, but not moved or reorganized for counting purposes. Observe which students are able to count objects in a scattered pattern. After counting the objects as they lie, have students count using various organization strategies such as the Ten Frame, making an array or lining them up in a straight row.

Comment: As students count the number of objects, ask them to count backwards from the total number of counters backwards to 10 or 0.

Once students have estimated, counted, and recorded their cup, have students return cups to the central location or switch cups with another student and repeat the steps.

As the session of *Counting Cups* comes to a close, gather students to the meeting area and have them share and compare the amount of objects counted in each cup. If students have disagreements, have them return to the cup and verify which quantity is correct.

FORMATIVE ASSESSMENT QUESTIONS

- How many did you have in your Counting Cup?
- How close was your estimate to the actual number of counters in the cup? How do you know?
- How many more would you need to have 20?
- How many would you need to take away to have only 10?

DIFFERENTIATION

Extension
- Provide students with cups that have more than 20 items. Have students count the items in the cup and observe which students automatically group items into sets of ten.

Intervention
- Provide a double ten frame for the students to organize their counters and/or have students model the number they counted by using a Rekenrek.

The Counting Cup

Cup Letter	Estimate	How many in the cup?

CONSTRUCTING TASK: The Cardinal Cup Revisited

STANDARDS FOR MATHEMATICAL CONTENT

MCC.K.CC.2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

MCC.K.CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality.
   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.
   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.
   c. Understand that each successive number name refers to a quantity that is one larger.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Children will learn *how* to count (matching counting words with objects) before they understand that the last count word indicates the *amount* of a set or the *cardinality* of a set. Children who have made this connection are said to have the *cardinality principle,* which is a refinement of their early ideas about quantity. (Van de Walle, 2006, p.39)

ESSENTIAL QUESTIONS

- Why do we need to be able to count objects?
- How do we use numbers every day?
- How do we use counting in our everyday life?
- Why do we need to be able to count forwards and backwards?

MATERIALS

- Cardinal Cup playing mat
- Playing cards from *Numerals, Pictures, Words*
- 20 objects for the cup and 20 counters to keep score
- Cup
- 6 or 10 sided dice or spinner
- Math journal to record numbers

GROUPING

Whole group/partners

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I (counting forward)

Students use the task cards from *Numbers, Pictures, Words(11-19)* and place them in a pile face down. Player 1 rolls the dice and places the corresponding number of objects in the cup. *Example: if a 4 was rolled, then player 1 places 4 counters in the cup.* Player 1 then turns over the top card and counts on from the number of objects in the cup to the number shown on the card. Player 1 counts out loud as each object is placed into the cup.

Once Player 1 is finished counting, Player 2 removes the contents from the cup and verifies that the correct number of cubes was placed in the cup by placing the objects on the counting mat. (1-to-1 correspondence) If the player was correct in counting out the objects they receive 1 counter to be placed on their ten-frame. The first player to fill up their ten frame wins.

Part II (counting forward and/or backwards)

Students use the task cards from *Numbers, Pictures, Words (11-19)* and place them in a pile face down. Player 1 rolls the dice and places the corresponding number of objects in the cup. (*Example: if a 4 was rolled then player 1 places 4 counters in the cup).* Player 1 then turns over the top card and counts on from the number of counters in the cup to the number shown on the card. Player 1 counts out loud as each counter is placed into the cup.

Once Player 1 has finished placing all the counters into the cup they turn over the next card from the pile and add/ remove cubes to/ from the cup to match the second card. As player 1 adds/removes cubes from the cup they must count out loud in forward or backward sequence with the starting number being the quantity in the cup. *The key is that player 1 must mentally retain the number of cubes that were in the cup after the first card and adjust the quantity in the cup without recounting the initial set of cubes. The new quantity must match the number displayed on the second card.*

After Player 1 has made the necessary change to the cup, Player 2 dumps the cup out to verify that the quantity in the cup matches the second card by using the counting mat. If the card and quantity match, player 1 gets a chip to place on their ten frame. The first player to fill up their ten frame wins.

Comment:
- Students can record the numeral they counted in their journal for practice.
- Ordinal numbers and understanding of positional words can be introduced /revisited through teacher questioning. (Example: what was the second number you had to count?

FORMATIVE ASSESSMENT QUESTIONS

- How many counters are there in this *set?*
- How do you know that you counted correctly?
- What strategy did you use to count forward/backwards?
- Is the number closer to 10 or 20? How do you know?

DIFFERENTIATION

Extension
- Ordinal numbers and understanding of positional words can be introduced /revisited through teacher questioning.
- Only using two different colored cubes would allow students to count while creating a pattern. (Example: 1st cube red, 2nd cube blue, 3rd cube red, etc…)

Intervention
- Repeated practice is the best intervention. To develop counting engage students in almost any game or activity that involves counts and comparison.
- Have students model the Cardinal Cup with a Rekenrek or with a ten-frame.

The Cardinal Cup

10   11   12   13   14   15   16   17   18   19   20
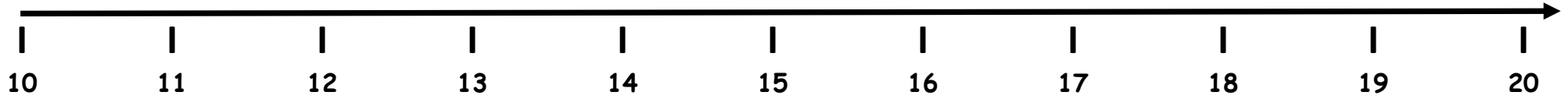
Player 1 Scoreboard

Player 2 Scoreboard
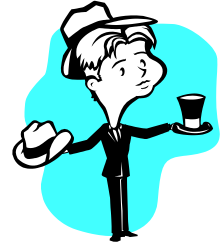
PRACTICE TASK: Make Sets of Less/Same/More
Approximately one day (Adapted from Van de Walle's activity 2.1)

STANDARDS FOR MATHEMATICAL CONTENT

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

MCCK.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.

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
   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.

MCCK.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.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEGDE

This task provides students with one of the many experiences he/she will need with sets of objects to be able to apply their understanding of the numeral 11-19 to compare one from another. Students aren't expected to be comfortable with this skill until the end of kindergarten. In this task, students create a set with counters, which gives them the opportunity to reflect on the sets and adjust them as they work.

ESSENTIAL QUESTIONS

- How did you count the dots?
- How did you know how many counters to put with the Less Card?
- How did you know how many counters to put with the More Card?
- Why wouldn't you count a dot more than once?
- How might you recognize the number of dots on a card without counting? (pattern)

MATERIALS

- Cards from *Numeral, Picture, Word*
- Set of Small Counters or Blocks
- Word Cards Labeled *More, Less* and *Equal*
- Word Cards Labeled *How many to 20?, Remove to 10*

GROUPING

Small Groups/Work Stations

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I
On index cards or sticky notes write the words "Less", "More", and "Equal".

Provide students with the task cards from *Numeral, Picture, Word* and place them face down in a pile. Have students use a set of small objects to model numbers that are more, less and equal to the number shown on the card.

Lay the index cards side by side on the carpet or table. Students turn over a task card and next to each index card students must create a set of objects that match the post it. For example, if a student turned over a task card with 14 on it, the student would count out 14 objects and place them next to the "equal" index card. The students would then make a set that is "more than" and "less than" as it corresponds to the card turned over.

Part II
This version of the task is exactly the same as Part 1 except the index cards are different. Exchange the *less* and *more* cards to *remove to make 10* and *more to make 20*. In this part, students turn over a number card and make a set that is equal. Then students must identify how many counters need to be added to make 20 and removed to make a 10. The corresponding number of counters needed to be removed or added to the initial set is placed next to the index card.

FORMATIVE ASSESSMENT QUESTIONS

- How do you know the set is equal?
- What strategy are you using to show more or less?
- What strategy are you using to find out how to get to 10 or 20?
- Is ____ more or less than the than the number set you made?

DIFFERENTIATION

Extension
- Provide larger quantities of same items for students to compare.
- The more/less cards can be more specific. For example: instead of saying "more" the index card could say 2 more/2 less.

Intervention
- Model for students comparing with a one-to-one correspondence arrangement.
- Gradually reduce the comparison to "Less". Once that is solidified, introduce comparing for "More".
- Pair the student with a child who can work through the comparisons with him/her while articulating why he/she made the choices for the Less, More, and Same cards.

PRACTICE TASK: One More/Less Than Dominoes
Approximately one day (Adapted from Van de Walle's Make Sets of More/Less/Same activity 2.10)

STANDARDS FOR MATHEMATICAL CONTENT

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

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
   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.

MCCK.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.

MCCK.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.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEGDE

When children count, they have no reason to reflect on the way one number is related to another. The goal is only to match number words with objects until they reach the end of the count. To learn that 6 and 8 are related by the twin relationships of "two more than" and "two less than" requires reflection on these ideas within tasks that permit counting. Counting on (or back) one or two counts is a useful tool in constructing these ideas. (Van de Walle, 2006, p.44)

ESSENTIAL QUESTIONS

* How can you explain how one end of a domino connects to another?

- How do you know which side of the domino is more?
- How do you know which side of the domino is less?

MATERIALS

- Dominoes

GROUPING

Small Groups/Work Stations

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I
In this task, students match ends of the domino to a domino with one less. Use the dot-pattern dominoes or a standard set to play "one-less-than" dominoes. Play in the usual way, but instead of matching ends, a new domino can be added if it has an end that is one less than the end on the board. As students are playing they should explain and justify their reasoning as to how they know a number is greater or less than another. (Example: *1 less than 6 is 5 OR I know that 5 is one less than 6 because I need 2 hands to count 6 and only one hand to count to 5*)

Part II
A similar game can be played for two less, one more, or two more.

FORMATIVE ASSESSMENT QUESTIONS

- How do you know you have more/less?
- What is the difference between more and less?
- What does equal mean?

DIFFERENTIATION

Extension
- Have students order the dominoes by the using the total amount of pips on each domino. Some dominoes will have an equal amount of pips which is an opportunity to observe how students organize them.

Intervention
- Allow students to use a double ten frame to model 2 quantities less than ten. Example: if the domino in play was a 5, the students would model a 5 in one ten frame and model one less than 5 in the next 10 frame.

Constructing Task: Riddle Me This?

STANDARDS FOR MATHEMATICAL CONTENT

MCCK.NBT.1 Compose and decompose numbers from 11 to 19 into ten o
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.

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to
cardinality.
   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.

MCCK.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.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

The relationships of one more than, two more than, one less than, two less than are important for all
numbers. However, these ideas are built on and connected to the same concepts for numbers less
than 10. The fact that 17 is one less than 18 is connected to the idea that 7 is one less than 8.
Children may need help in making this connection after some quality time spent in the exploration of
these numbers.
.
ESSENTIAL QUESTIONS

- When do we use counting skills in everyday life?
- How can you know a quantity without counting each object?
- Why do I need to be able to count objects?

- Why do we need to be able to count forwards and backwards?
- What is the difference between a group of ten and the leftovers?

MATERIALS

- *Riddle Me This?* task cards
- Single or Double Ten Frame
- Counters

GROUPING

Whole group/Partner

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Create a number on a ten frame. Invite students to discuss and share everything they notice about the number. Example if the number 8 is on the 10 frame.

●	●	●	●	●
●	●	●		

3 more than 5	2 less than 10	4 groups of 2
2 groups of 3 and 2 more	3 groups of 2 and 2 more	2 groups of 4

Riddle for "8"- *I am a number. I am more than 5. If you give me 2 more dots I would make a 10? I am a 1-digit number. What number am I?*

I am a number, I have a 5 and 2 more. What number am I?
I am a number, I am 1 less than 6. What number am I?

Make up riddles about numbers from 0-20 and have students try and identify the mystery number.

This task can be repeated throughout the year. As students become more comfortable with the concept and with reading and writing, have them make their own mystery riddles and share them with classmates. Students can use the *Riddle Me This?* task cards to help create riddles. When modeling riddles to students, it is extremely beneficial to model using the task cards.

Comment:
Create a word bank that students can use to help them write their riddles. Some possible suggestions to add to your word bank could be:
   I am more than ____
   I am less than____
   I am ____ counters more/less than ____

I am a _____-digit number, etc.…

FORMATIVE ASSESSMENT QUESTIONS

- How do you know that you counted correctly?
- What is a good way to justify your answer?
- What strategy are you using to solve the riddle?
- Is the number closer to 10 or 20? How do you know?

DIFFERENTIATION

Extension
- Use a higher number and increase the rigor of the questions in the riddle.
    Example:

I am a number,
I have 1 group of 5 and 7 ones.
What number am I?

Intervention
- In a small group have student answer riddles about smaller numerals.
- Use a 5-frame or10-frame riddles to limit the possible answers to the riddle**.**

I am a number,
I am 2 less
than_____.
What number am I?

I am a number,
I have _____
more than 5.
What number am I?

I am a number,
I am 2 more
than_____.
What number am I?

I am a number,
I am 1 less
than_____.
What number am I?

I am a number,
I am 2 less
than_____.
What number am I?

I am a number,
I have _____ ten
and _____more.
What number am I?

Constructing Task: Moving a Cup of 10

STANDARDS FOR MATHEMATICAL CONTENT

MCCK.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.

MCCK.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).

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
   b. 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.

MCCK.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.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE
This task focuses on the set of ten and leftovers. Students begin to understand that numbers 11 to 19 are composed of ten ones and one, two, three, four, five, six, seven, eight or nine ones. Kindergarteners need to understand the idea of a ten so they can develop the strategy of adding onto 10 to add within 20 in Grade 1. Manipulatives should be used to model and connect numbers between 11 and 19 to ten ones and some "left over". Such as, thirteen is 10 ones and 3 more. When children are working on counting objects, they should explore different relationships within the number that would make the number easier to count.

ESSENTIAL QUESTIONS
- What is an efficient strategy for counting teen numbers?

MATERIALS

- (1) six sided dice
- Cup
- 20 counters
- *Moving a Cup of 10* task sheet
- *Moving a Cup of 10* recording sheet

GROUPING

Partner task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Place cup in the blank circle and roll die 3 times. After EACH roll, player 1 puts the counters in the cup and counts aloud. Try to remember how many counters were in the cup between each roll to continue counting-on.

Once the cup has 10 counters, slide the cup over and place the leftover counters in the circle. If the amount of counters in the cup does not reach 10 it does not slide over. After each roll, player 1 states the total amount of counters. (*I have 7 ones in the cup and that makes 7* OR *I have a cup of ten and 3 more which makes 13).*

Each time the player rolls, they record the last number on the *Moving a Cup of 10* recording sheet. In the column that states *I have...* students should record what they have as it relates to a ten and ones. *(Example: 8 …The students would record "8 ones" or for 12 the students would state " 1 ten and 2 more")*

After player 1 has stated the total amount of counters, player 2 dumps out the cup and counts the total number of counters earned after 3 rolls of the dice. Player 2 verifies that player 1 was correct in determining the total.

Comment: THIS IS NOT A LESSON OF PLACE VALUE AND SHOULD NOT BE TAUGHT AS SUCH. Instead this lesson should focus on making a ten, then counting-on, which is part of the foundational understanding to place value.

FORMATIVE ASSESSMENT QUESTIONS

- How many more counters do you need to fill your cup?
- If I took 1 counter out of your cup how many would be in there?

- If I added 1 more how many would be in there?
- What is the least amount of counters you could have in your cup after 3 rolls? Explain?
- Is the number closer to 10 or 20? How do you know?
- What is the greatest amount of counters you could have in your cup after 3 rolls? Explain?

DIFFERENTIATION

Extension
- Have students play without the recording sheet to work on number retention. Each time the student rolls the dice s/he must mentally retain the number at which they are, and continue the counting sequence, which improves a student's counting on abilities.
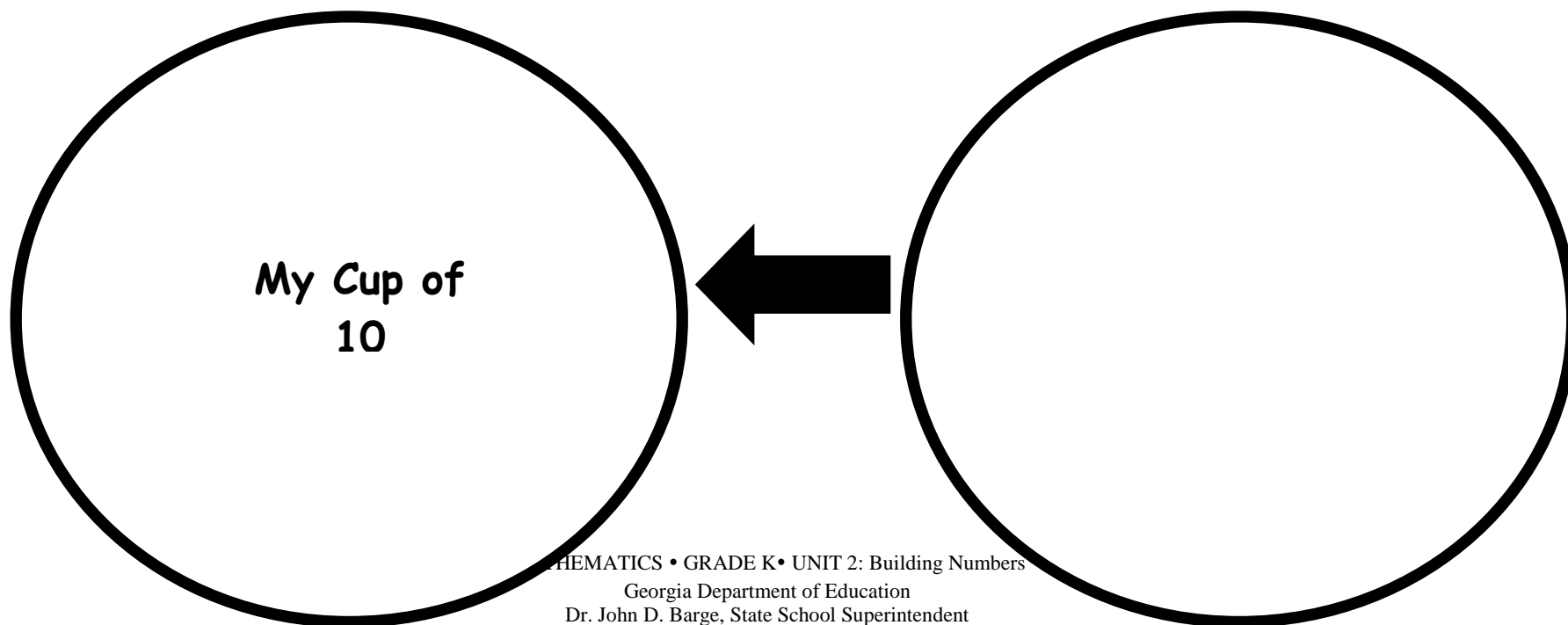
Intervention
- Have students place the counters next to the cup before making a cup of ten to reinforce counting and cardinality. Some students will struggle with remembering the amount of counters in the cup and with how to start counting from a number other than 1.
- Allow students to model using a number line or double ten-frame to keep track of the amount of counters used. In addition, the number of rolls used could be limited to 2.

Moving A Cup of 10

Place cup in the blank circle and roll 3 times. After EACH roll, player 1 puts the counters in the cup and counts aloud. Try to remember how many counters were in the cup between each roll to continue counting on.

Once the cup has 10 counters, slide the cup over and place the leftover counters in the circle. If the amount of counters in the cup does not reach 10, it does not slide over. After each roll, player 1 states the total amount of counters. (*I have 7 ones in the cup and that makes 7* OR *I have a cup of ten and 3 more which makes 13*).

After player 1 has stated the total amount of counters, player 2 dumps out the cup and counts the total number of counters earned after 3 rolls of the dice. Player 2 verifies that player 1 was correct in determining the total.

My Cup of
10

←

Moving a Cup of 10

1ˢᵗ Roll	2ⁿᵈ Roll	3ʳᵈ Roll	I have….

<u>Constructing Task:</u> Make a 10 and Carry On

STANDARDS FOR MATHEMATICAL CONTENT

MCCK.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.

MCCK.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).

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
   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.

MCCK.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.

MCCK.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.

MCCK.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

MCCK.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

It is absolutely essential that students develop a solid understanding of the base-ten numeration system in prekindergarten through grade 2. They must recognize that the word ten may represent a single entity (1 ten) or ten separate units (10 ones) and that these representations are interchangeable. Using concrete materials and calculators in appropriate ways can help students learn these concepts (NCTM, 2012).

ESSENTIAL QUESTIONS

- What is an efficient way to count an amount greater than ten?
- How can we use counting in our everyday life?
- Why is counting very important?
- Why do I need to be able to count objects?

MATERIALS

- *Make a Ten and Carry On* game board
- 10 pennies and 2 dimes or 10 cubes and 1 ten rod
- 6 sided dice

GROUPING

Whole group/Partner

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I
Each student has a game board and they take turns rolling the dice.

Students add the number of pennies/cubes to their mat that matches each roll. Because each player will have only 10 pennies/cubes they will be unable to count past ten without making a unit of 10 (dime/rod).
At the end of each turn the player must state what they have on their mat as units and say the total. *(Example: I have 1 group of ten and 5 more which makes 15).* First player to reach or go beyond 20 wins.

Part II
Play the same way as part one except players roll 4 times then compare to see which player has the greater number.

FORMATIVE ASSESSMENT QUESTIONS

- What is an efficient way to count larger numbers?
- Why do we group things in tens?
- How many pennies/cubes are needed to make a dime/rod?
- Who rolled the greater amount? How do you know?
- What is the greatest/least amount you could roll?
- Is the number closer to 10 or 20? How do you know?

DIFFERENTIATION

Extension
- Once a player reaches exactly 20 they continue to roll the dice and remove the corresponding number of counters to practice counting backwards sequence and 1 to 1 correspondence.

Interventions
- Students could model the task by using a double ten frame. When the student has reached ten they trade it in for a dime or rod. The 10 pennies/cubes are removed from the mat and dime/rod takes the place of the ten items.
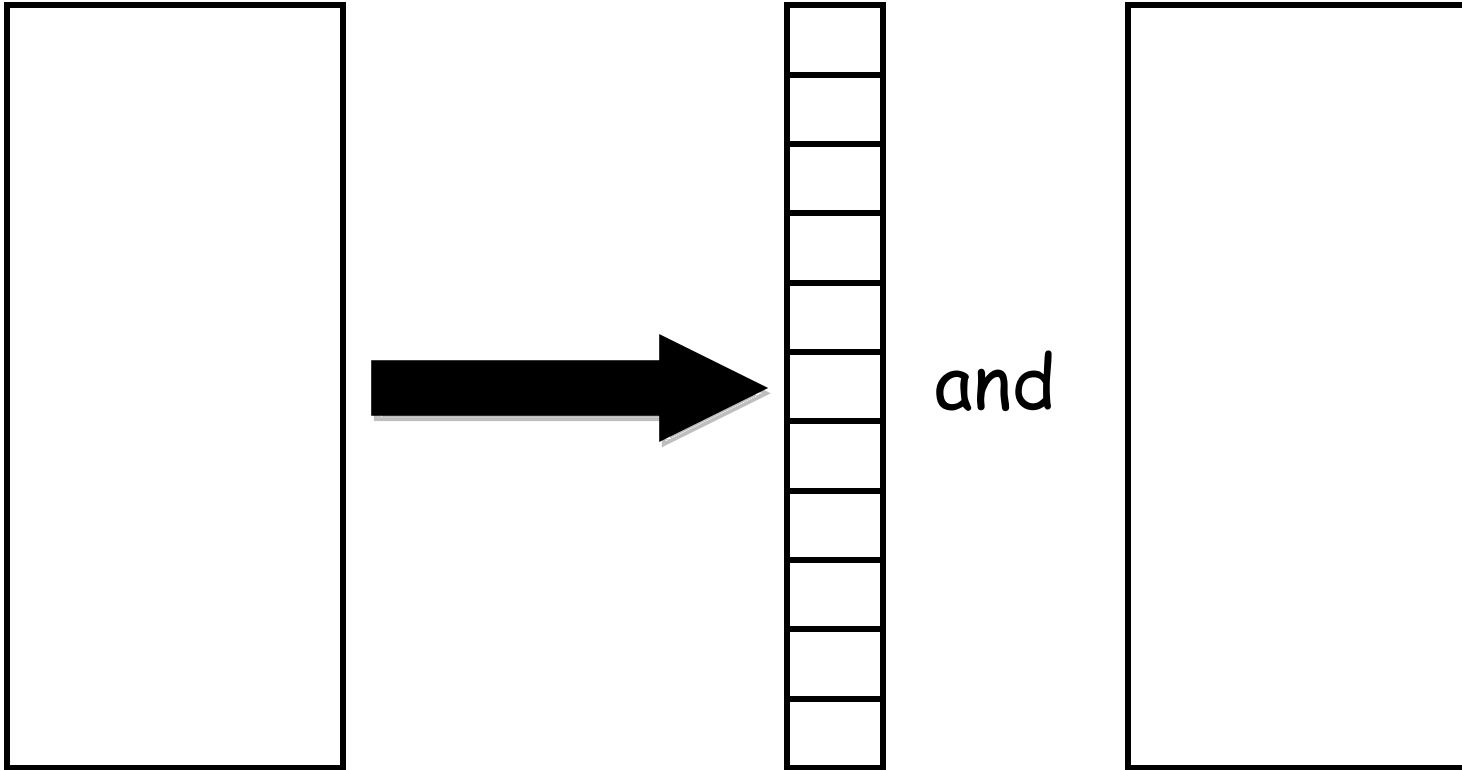
Make a 10 and Carry On

Making My Ten
group 10 ones into 1 group of ten

My Ten and Some More

Make a 10 and Carry On

and

I have _____ ones which make _____   I have _____ group of ten and _____ ones which make _____

Constructing Task: Race to 100 Pennies (Revisited)

STANDARDS FOR MATHEMATICAL CONTENT

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

MCCK.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.

MCC.K.CC.1 Count to 100 by ones and by tens.

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
   b.   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.

MCCK.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.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Students must see teen numbers as 1 group of ten and "some more". Students must also be able to see that the 1 group of ten is composed of ten groups of 1. This task allows students to unitize 10 groups of 1 group of ten as a dime. This will allow students to build the understanding that although a ten can be seen as one unit, it can also be decomposed into ten groups of one. This is called *"unitizing"*. As students begin to unitize quantity they begin to develop an understanding that the unit ten is the whole but it is composed of ten parts.

ESSENTIAL QUESTIONS

- How can we use counting in our everyday life?
- Why is counting very important?
- Why do I need to be able to count objects?
- What is an efficient way to count an amount great than ten?

MATERIALS

- Piggy Bank Recording Sheet
- 20 pennies, 4 nickels and 20 dimes

GROUPING

Whole group/Partner

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I

Give each student a ten frame piggy bank sheet. Model for the students how you can fill the ten-frames with up to twenty pennies. Show the students that this is equal to two dimes (entertain conversation about this also being equal to four nickels). Play "Roll for a Dime" with a partner. Students take turns rolling two 1-6 number cubes. After each roll, the player takes the number of pennies to match the number on the cube and places them on his/her ten frames. If a player already has 8 pennies in their ten-frame and rolls a 5, they add 2 to make a ten, trade it in for a dime, place the dime in the piggy bank and add the addition 3 pennies to the ten frame. After the additional pennies have been added to the ten-frame the player must skip count by tens to determine the total quantity of pennies in the piggy bank. The first player to have 100 cents (10 dimes) in their piggy bank wins.

FORMATIVE ASSESSMENT QUESTIONS

- How do you know that you counted correctly?

DIFFERENTIATION

Extension
- Give each student a five frame piggy bank sheet. Model for the students how you can fill the five-frame with five pennies. Show the students that this is equal to one nickel. Play "2 Nickels for a Dime" with a partner. Students take turns rolling a number cube. After each roll, the player takes the number of pennies to match the number on the cube and places them on his/her five frame. If the player rolls a 6 they will fill in the five-frame and trade in for a nickel and add the extra 1 to their five frame. Once five pennies is

traded in for a nickel it is placed on the nickel spot on the recording sheet. After each turn, the player must skip count by tens to determine the total quantity of pennies in the piggy bank. The first player to have 100 cents (10 dimes) in their piggy bank wins.
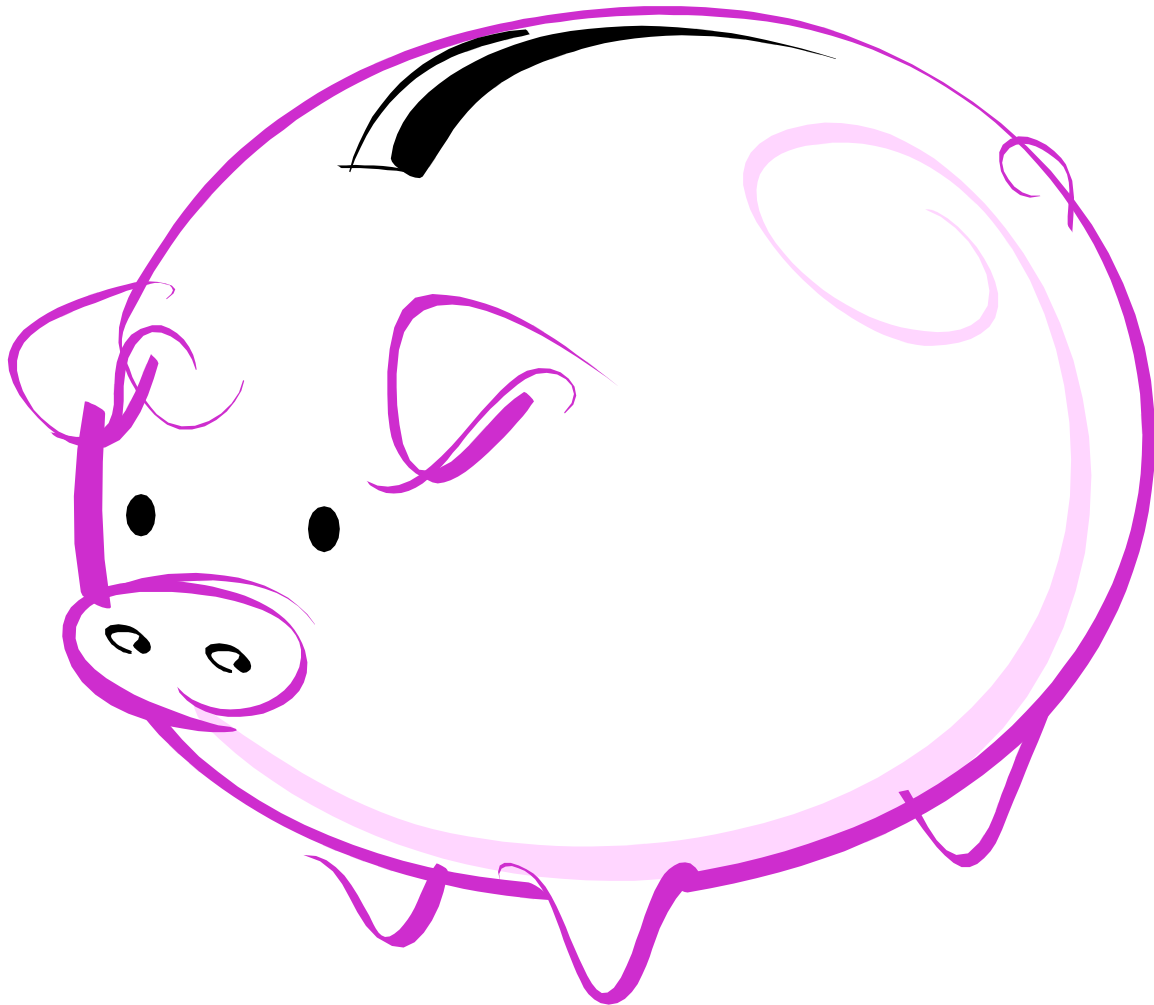
Intervention
- Use "Math Talk" Cards to verbalize the amount. "I have _____ pennies. I can trade_____ pennies for a _____.
I won the game because I had _____ more.

Roll for a Dime

2 Nickels for a Dime

Georgia Department of Education
Common Core Georgia Performance Standards Framework
Kindergarten Mathematics • Unit 2

10

PERFORMANCE TASK: TEN AND SOME MORE
Approximately one day (Adapted from Van de Walle's Ten and Some More activity 2.26)

STANDARDS FOR MATHEMATICAL CONTENT

MCCK.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.

MCCK.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).

MCCK.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
   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.

MCCK.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.

MCCK.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.

MCCK.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

MCCK.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

This task focuses on the set of ten and leftovers. Students begin to understand that numbers 11 to 19 are composed of ten ones and one, two, three, four, five, six, seven, eight or nine ones. Kindergarteners need to understand the idea of a ten so they can develop the strategy of adding onto 10 to add within 20 in Grade 1. Manipulatives should be used to model and connect numbers between 11 and 19 to ten ones and some "left over". Such as, thirteen is 10 ones and 3 more. When children are working on counting objects, they should explore different relationships within the number that would make the number easier to count.

ESSENTIAL QUESTIONS

- Why do I need to be able to count objects?
- How do I use numbers every day?
- Why would I need to be able to read number words?

MATERIALS

- *Ten and Some More* Task sheet
- Bags
- Small items to place in each bag

GROUPING

Small Group, partner, individual

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Comments
Prepare and label bags (A-E) with 11-19 objects. Because this is a performance task and students will work independently when possible, have 3 bags of each letter (each bag lettered "A" should have the same type and amount of counters). You can put any small object in the bags (e.g. beans, counting cubes, small centimeter blocks, paper clips, crayons, pencils etc…) Because this is a performance task it could be extremely beneficial to document students responses to the formative assessment questions as the can be recognized as summative at this time.

Task Directions
Place each bag as a station or in at central location in classroom where students can exchange bags. When modeling to students what is expected be sure the model bag DOES NOT HAVE the same amount of items as one of the bags lettered A-E. (For example: the model number is 14 and none of the bags lettered A-E contain 14 items.

Bag	Estimate (make a guess)	How many groups of 10 can you make?	How many singles are left over?	Number of items in the bag	How far away was your estimation?	Closer to 10, 15, or 20? How far away?
Sample	16	1	4	14	2 away	10 **15** 20 __1__

As students work through this task they complete the follow list of tasks and record their finding on the task sheet:
1. Empty the contents of the bag into 1 pile. Estimate how many items are in the bag and record
2. How many groups of 10 can you make? Record the result?
3. How many items are left over after making a group of 10? Record the result.
4. Record the total number of items in the bag
5. Was your estimate close? How do you know? Record the result. (focus on counting sequence and not the difference as subtraction has not yet been introduced)
6. Is the number of items closer to 10, 15 or 20. How far away is the number from the nearest benchmark?

FORMATIVE ASSESSMENT QUESTIONS

- Did either of the bags have the same amount?
- How many groups of 10 are in the number _____?
- How many items were in the bag?
- How many would you need to remove to have 10?
- If you had 1 more in your bag, how many would you have? If you had 1 less?
- Is the number closer to 10 or 20? How do you know?
- What does the "*some more*" part mean?
- What would happen if I removed 10 items?
- Which bag contained the least amount of objects?
- Which bag had an amount closest to 10? Closest to 20?
- Which bag had the most? Least?

DIFFERENTIATION

Extension
- Give the students a larger quantity of objects in their bags with which to complete the assignment.
- Have the students dump the contents of two bags onto the table, then have them discuss how many were in each bag and compare the amounts. Have students estimate which bag has the

most and least before counting and determining how many more objects are needed for the contents to be equal.
- On the back of their recording sheet, have the students arrange the quantity they recorded in numeric order from least to greatest.

Intervention
- Give students a 10-frame and have them place objects within each square to count out 10 ones and then describe how many are left over.
- Provide a cookie sheet with scrambled teen numbers. Ask student to unscramble the numbers and place them in the correct order. Once this is completed, ask student to point to each card and say the number. Check student's number recognition by pointing to random cards out of sequence.

Ten and Some More

Name:_____

Bag	Estimate (make a guess)	How many groups of 10 can you make?	How many singles are left over?	Total in the bag	How far away was your estimation?	Closer to 10, 15, or 20? How far away?
A						10 15 20 _____
B						10 15 20 _____
C						10 15 20 _____
D						10 15 20 _____
E						10 15 20 _____