Georgia Standards of Excellence Curriculum Frameworks

Mathematics

GSE Kindergarten

Unit 2: Comparing Numbers

Georgia Department of Education

Richard Woods, Georgia's School Superintendent

"Educating Georgia's Future"

Kindergarten Unit 2: Comparing Numbers

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TASKS

IF YOU HAVE NOT READ THE KINDERGARTEN CURRICULUM OVERVIEW IN ITS ENTIRETY PRIOR TO USE OF THIS UNIT, PLEASE **STOP** AND CLICK HERE: https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Grade-Level-Overview.pdf Return to the use of this unit once you've completed reading the Curriculum Overview. Thank you.

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 the curriculum 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, and ones.**

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.

In Kindergarten, instructional time should focus on two critical areas:

(1) Representing, relating, and operating on whole numbers, initially with sets of objects. Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of less 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) 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 equationssuchas5+2=7and7 - 2=5. *(Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.)*

For more detailed information about unpacking the content standards, unpacking a task, math routines and rituals, maintenance activities and more, please refer to the Grade Level Overview.

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. The statements provided offer a few examples of connections between the Standards for Mathematical Practice and the Content Standards of this unit. This list is not exhaustive and will hopefully prompt further reflection and discussion.

Students are expected to:

1. **Make sense of problems and persevere in solving them.** Students will analyze and solve problems through rote counting, recognizing number patterns and identifying quantities of items.

2. **Reason abstractly and quantitatively.** Students demonstrate abstract reasoning by writing numerals to represent a specific amount and creating a set to match a given numeral.

3. **Construct viable arguments and critique the reasoning of others.** Students begin to explain and organize their thoughts by answering questions about how they know they counted correctly and asking classmates to explain how they found their answer.

4. **Model with mathematics**. Students will use blocks, pictures and other manipulatives to represent quantities and counting sequences.

5. **Use appropriate tools strategically.** Students will select and use tools such as ten frames, counting cubes and number lines to represent situations involving teen numbers.

6. **Attend to precision.** Students will build their mathematical vocabulary by expressing their ideas and explaining their reasoning using words with regard to quantity and cardinality.

7. **Look for and make use of structure.** Students will look for patterns and structure in the number system by working with dot cards, number lines and ten frames.

8. **Look for and express regularity in repeated reasoning**. Students will recognize repetitive action in counting such as that each number is one more than the previous through experiences with numbers and counting.

(For descriptors of standard cluster please see the Grade Level Overview)
*****Mathematical Practices 1 and 6 should be evident in EVERY lesson*****

STANDARDS FOR MATHEMATICAL CONTENT

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

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

Counting and Cardinality

Know number names and the count sequence.

MGSEK.CC.1 Count to 100 by ones and by tens.

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

MGSEK.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).

Count to tell the number of objects.

MGSEK.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.(one-to-one correspondence)
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.

MGSEK.CC.5 Count to answer 'how many?" questions.

a. Count to answer "how many?" questions about as many as 20 things arranged in a variety of ways (a line, a rectangular array, or a circle), or as many as 10 things in a scattered configuration.
b. Given a number from 1-20, count out that many objects.
c. Identify and be able to count pennies within 20. (Use pennies as manipulatives in multiple mathematical contexts.)

Compare numbers

MGSEK.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. (Limit category counts to be less than or equal to 10)

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

Classify objects and count the number of objects in each category.

MGSEK.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)

Number Sense Trajectory –*Putting It All Together*

Trajectory	**Subitizing** Being able to visually recognize a quantity of 5 or less.	**Comparison** Being able to compare quantities by identifying which has more and which has less.	**Counting** Rote procedure of counting. The meaning attached to counting is developed through one-to-one correspondence.	**One-to-One Correspondence** Students can connect one number with one object and then count them with understanding.	**Cardinality** Tells how many things are in a set. When counting a set of objects, the last word in the counting sequence names the quantity for that set.	**Hierarchical Inclusion** Numbers are nested inside of each other and that the number grows by one each count. 9 is inside 10 or 10 is the same as 9 + 1.	**Number Conservation** The number of objects remains the same when they are rearranged spatially. 5 is 4&1 OR 3&2.

Each concept builds on the previous idea and students should explore and construct concepts in such a sequence

Number Relationships	Spatial Relationship Patterned Set Recognition Students can learn to recognize sets of objects in patterned arrangements and tell how many without counting.	One and Two-More or Less Students need to understand the relationship of number as it relates to +/- one or two. Here students should begin to see that 5 is 1 more than 4 and that it is also 2 less than 7.	Understanding Anchors Students need to see the relationship between numbers and how they relate to 5s and 10s. 3 is 2 away from 5 and 7 away from 10.	Part-Part-Whole Relationship Students begin to conceptualize a number as being made up from two or more parts.

Addition and Subtraction Strategies

One/Two More/Less These facts are a direct application of the One/Two More/ Less than relationships	**Make a Ten** Use a quantity from one addend to give to another to make a ten then add the remainder. 9 + 7 = 10 + 6	**Near Doubles** Using the doubles anchor and combining it with 1 and 2 more/less.
Facts with Zero Need to be introduced so that students don't over generalize that answers to addition are always greater.	**Doubles** Many times students will use doubles as an anchor when adding and subtracting.	

BIG IDEAS

- 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 greater.
- 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

- What is the difference between a group of ten and the leftovers?
- Why is counting important?
- How can you know a quantity without counting each object?
- How can numbers be represented?
- How do you know how many objects you have?
- How do you know if you have more or less than your partner?
- How might you recognize the number of dots on a card without counting?
- How can you explain how one end of a domino connects to another?
- When do we use counting skills in everyday life?
- What is an efficient strategy for counting teen numbers?
- How can you know a quantity without counting each object?
- How do we use counting in our everyday lives?
- What is an efficient way to count an amount greater than ten?
- Why do I need to be able to count objects?
- How do I use numbers every day?

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.

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 greater 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 grouped and pre-grouped materials (see resources/tools). Students can transition from grouped to pre-grouped 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, and then move to experiences with pennies and dimes.

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**

Mathematics Glossary

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.

TASK DESCRIPTIONS

Scaffolding Task	Tasks that build up to the learning task.
Constructing Task	Constructing understanding through deep/rich contextualized problem-solving tasks.
Practice Task	Tasks that provide students opportunities to practice skills and concepts.
Culminating Task	Designed to require students to use several concepts learned during the unit to answer a new or unique situation. Allows students to give evidence of their own understanding toward the mastery of the standard and requires them to extend their chain of mathematical reasoning.
Formative Assessment Lesson (FAL)	Lessons that support teachers in formative assessment which both reveal and develop students' understanding of key mathematical ideas and applications. These lessons enable teachers and students to monitor in more detail their progress towards the targets of the standards.
3-Act Task	A Three-Act Task is a whole-group mathematics task consisting of 3 distinct parts: an engaging and perplexing Act One, an information and solution seeking Act Two, and a solution discussion and solution revealing Act Three. More information along with guidelines for 3-Act Tasks may be found in the ***Guide to Three-Act Tasks*** on georgiastandards.org.

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	Standards	Task Type/ *Grouping Strategy*	Content Addressed	Brief Description
Peas-in-a-Pod	**MGSEK.NBT.1 MGSEK.CC.1-3,4abc,7 MGSEK.MD.3**	3-Act Task *Whole Group*	Estimating, Number relationships, Comparing sets, One to one correspondence, Categorizing	Students will use their number knowledge to count forwards and backwards and count numbers higher than ten
Got Dots Revisited (11-20)	**MGSEK.CC.5a,b-7**	Scaffolding Task *Whole/Small Group Partner/Individual*	Number relationships, Comparing sets, One to one correspondence	Students engage in numerous activities to count quantities of objects greater than ten.
Numeral, Picture, Word (11-20)	**MGSEK.CC.1-4**	Scaffolding Task *Whole/Small Group Partner/Individual*	Counting, Numeral recognition, Number relationships, Recognizing number words	Students engage in numerous activities to connect numerals, picture representations and words.
"Teen" Frame Talk About (11-12)	**MGSEK.NBT.1 MGSEK.CC.3,4a,5a,b**	Constructing Task *Whole Group/Partner*	Number relationships	Students work in a class discussion to understand the concept that a teen number is a group of ten and some more
"Teen" Frame Talk About (13-19)	**MGSEK.NBT.1 MGSEK.CC.3,4a,5a,b, 6**	Constructing Task *Whole Group/Partner*	Number relationships	Students continue the work of the previous task with numbers 13-19.
Counting Cup	**MGSEK.NBT.1 MGSEK.CC.3,4a,5a,b, 6,7 MGSEK.MD.3**	Practice Task *Small Group or Partner*	Estimating and one to one correspondence	Students practice counting forwards and backwards with various amounts of objects.
The Cardinal Cup (revisited 11-19)	**MGSEK.CC.2,4**	Constructing Task *Whole Group/partner*	Counting and number sequence	Students practice counting forwards and backwards.

Make Sets of Less/Same/More	**MGSEK.NBT.1 MGSEK.CC.4a,6**	Scaffolding Task *Small Group/Individual*	Counting, Numeral recognition, Number relationships, Recognizing number words	Students practice making sets that are the same, less, and more than the quantity given.
One More/Less Than Dominos	**MGSEK.CC.4a,5a,b,6**	Scaffolding Task *Small Group/Individual*	Comparing sets, Number relationships	Students work with one more and one less when completing the task.
Riddle Me This	**MGSEK.NBT.1 MGSEK.CC.4a,6**	Constructing Task *Whole Group/Partner*	Number relationship, Comparing sets	Students use their knowledge of counting and cardinality to answer riddles.
Moving a Cup of 10	**MGSEK.NBT.1 MGSEK.CC.3,4b,5a,b**	Constructing Task *Partner*	Counting, One to one correspondence, Unitizing	Students practice making ten and some more when building teen numbers.
Make a 10 and Carry On	**MGSEK.NBT.1 MGSEK.CC3,4a,5a,b,c ,6,7 MGSEK.MD.3**	Constructing Task *Whole Group/Partner*	Counting, Unitizing	Students use pennies and dimes to create a group of ten and some more.
Race to 100 Pennies(revisited)	**MGSEK.NBT.1 MCC.KCC.1,4b,5a,b,c, 6**	Constructing Task *Whole Group/Partner*	Counting, One to one correspondence, Skip counting, Unitizing	Students use their knowledge of building teen numbers to complete the activity using ten and some more.
10 and Some More	**MGSEK.NBT.1 MGSEK.CC.3,4a,5a,b, 6,7 MGSEK.MD.3**	Culminating Task *Small Group/Individual*	Counting, One to one correspondence, Number relationships, Comparing sets	Students will use all the information gained from this and the previous unit to complete the task by showing their understanding of teen numbers.

Each task is suggested but not required; teachers should choose the most appropriate tasks based on the needs of their students. For more information on the tasks in this unit please refer to the unit webinar found at: https://www.georgiastandards.org/Archives/Pages/default.aspx

INTERVENTION TABLE

The Intervention Table below provides links to interventions specific to this unit. The interventions support students and teachers in filling foundational gaps revealed as students work through the unit. All listed interventions are from New Zealand's Numeracy Project.

Cluster of Standards	Name of Intervention	Snapshot of summary or Student I can statement. . .
Working with numbers 11-19 to build a foundation of place value MGSEK.NBT.1	Birthday Cake	Count, identify and form groups of items to 20.
	Caterpillar Legs	Identify numbers 0-20. Count, order and form groups of items to 10.
	Feed the Elephants	Count, identify and form a set of objects in the range 1-20.
Counting and cardinality Know number names and count sequence MGSEK.CC.1 MGSEK.CC.2 MGSEK.CC.3	Birthday Cake	Count, identify and form groups of items to 10.
	Caterpillar Legs	Identify numbers 0-20. Count, order and form groups of items to 10.
	Clapping	Say the forwards and backwards number word sequence in the range 0-10, 0-20, 0-100
	Counting as We Go	Form a set of objects and identify all the numbers in the range 0-10.
	Flower Petals	Count, form and identify all the numbers of a set of objects in the range 0-10.
	Number Line Flips	Order and say the forwards and backwards number word sequences in the range 0-10, 0-20.
	Arrow Cards	Order numbers in the range 0-100.
	Before and After	Say the forwards and backwards number word sequences in the range 0-20.

Count to tell the number of objects MGSEK.CC.4 MGSEK.CC.5	Feed the Elephants	Count, identify and form a set of objects in the range 1-10.
	How Many Cubes?	Count a set of objects in the range 1-10.
	Match it up	Count, form and identify all the numbers of a set of objects in the range 0-10.
	Ten Frames Matching Game	Know groupings of five, within ten, and with ten.
Compare numbers MGSEK.CC.6 MGSEK.CC.7	Who is the Richest	Order numbers in the range 0-20
Classify and count the number of objects in each category MGSEK.MD.3	Flower Petals	Count, form and identify all the numbers of a set of objects in the range 0-10.

3-ACT TASK: Peas-in-a-pod

Back to Task Table

Approximately 1 day *Adapted from: www.gfletchy.com*

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them. Students will analyze and solve problems through rote counting, recognizing number patterns and identifying quantities of items.

2. Reason abstractly and quantitatively. Students demonstrate abstract reasoning by writing numerals to represent a specific amount and creating a set to match a given numeral.

3. Construct viable arguments and critique the reasoning of others. Students begin to explain and organize their thoughts by answering questions about how they know they counted correctly and asking classmates to explain how they found their answer.

4. Model with mathematics. Students will use blocks, pictures and other manipulatives to represent quantities and counting sequences.

5. Use appropriate tools strategically. Students will select and use tools such as ten frames, counting cubes and number lines to represent situations involving teen numbers.

6. Attend to precision. Students will build their mathematical vocabulary by expressing their ideas and explaining their reasoning using words with regard to quantity and cardinality.

7. Look for and make use of structure. Students will look for patterns and structure in the number system by working with dot cards, number lines and ten frames.

8. Look for and express regularity in repeated reasoning. Students will recognize repetitive action in counting such as that each number is one more than the previous through experiences with numbers and counting.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

MGSEK.CC.1 Count to 100 by ones and by tens.

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

MGSEK.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).

MGSEK.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.(one-to-one correspondence)
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

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

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

BACKGROUND KNOWLEDGE

This task follows the 3-Act Math Task format originally developed by Dan Meyer. More information on this type of task may be found at http://blog.mrmeyer.com/category/3acts/.
A Three-Act Task is a whole-group mathematics task consisting of 3 distinct parts: an engaging and perplexing Act One, an information and solution seeking Act Two, and a solution discussion and solution revealing Act Three.
More information along with guidelines for 3-Act Tasks may be found in the ***Guide to Three-Act Tasks*** on georgiastandards.org.

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.

COMMON MISCONCEPTIONS

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.

ESSENTIAL QUESTIONS

In order to maintain a student-inquiry-based approach to this task, it may be beneficial to wait until Act 2 to share the EQ's with your students. By doing this, students will be allowed the opportunity to be very creative with their thinking in Act 1. By sharing the EQ's in Act 2, you will be able to narrow the focus of inquiry so that the outcome results in student learning directly related to the content standards aligned with this task.

- What is the difference between a group of ten and the leftovers?
- What is an efficient way to count an amount greater than ten?

MATERIALS

- Act 1 video http://gfletchy3act.wordpress.com/peas-in-a-pod/
- Act 2 information (word document attached)
- Act 3 video http://gfletchy3act.wordpress.com/peas-in-a-pod/

GROUPING

Individual/Partner Task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION (All SMP's apply!)

In this task, students will view the video and tell what they noticed. Next, they will be asked to discuss what they wonder about or are curious about. These questions will be recorded on a class chart or on the board. Students will then use mathematics to answer their own questions. Students will be given information to solve the problem based on need. When they realize they don't have the information they need, and ask for it, it will be given to them. Students will use the information given to create a teen number.

Task Directions

Act 1 – Whole Group - Pose the conflict and introduce students to the scenario by showing Act I video or picture. **(Dan Meyer** http://blog.mrmeyer.com/2011/the-three-acts-of-a-mathematical-story/**)**
"Introduce the central conflict of your story/task clearly, visually, viscerally, using as few words as possible."

- Show Act 1 video to the students. http://gfletchy3act.wordpress.com/peas-in-a-pod/
- Ask students what they noticed in the video, what they wonder about, and what questions they have about what they saw in the video/picture. Consider doing a think-pair-share so that

students have an opportunity to talk with each other before sharing questions with the whole group. Students may need to watch the video several times.

- Share and record students' questions. The teacher may need to guide students so that the questions generated are math-related.
- Ask students to estimate answers to their questions (think-pair-share). For the question "How many peas will be in the pods?" students write down an estimate in their journals, then write down two more estimates – one that is too low and one that is too high. Allow students to identify their estimates on a number line. This is an excellent time to informally assess a student's understanding of quantity sizes, in addition to practicing writing numbers. Next, students discuss the questions and determine the information they need.

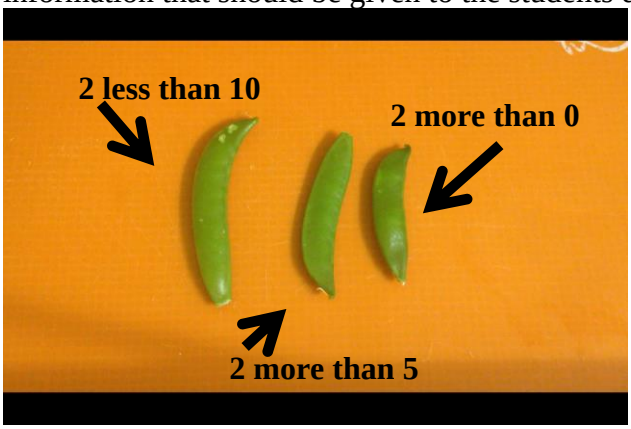
Anticipated questions students may ask and wish to answer:

- How many peas are in a pod?
- How many peas are there all together?

Act 2 – **Student Exploration** - Provide additional information as students work toward solutions to their questions. **(Dan Meyer** http://blog.mrmeyer.com/2011/the-three-acts-of-a-mathematical-story/**)**

"The protagonist/student overcomes obstacles, looks for resources, and develops new tools."

- During Act 2, students determine the main question(s) from Act 1 and decide on the facts, tools, and other information needed to answer the question(s). When students decide what they need to solve the problem, they should ask for those things. It is pivotal to the problem-solving process that students decide what is needed without being given the information up front. Some groups might need scaffolds to guide them. The teacher should question groups who seem to be moving in the wrong direction or might not know where to begin. The information provided in the picture below would be a good example of the type of information that should be given to the students during the second act.



Questioning is an effective strategy that can be used, with questions such as:

- What is the problem you are trying to solve?

- What do you think affects the situation?
- Can you explain what you've done so far?
- What strategies are you using?
- What assumptions are you making?
- What tools or models may help you?
- Why is that true?
- Does that make sense?

Act 3 – Whole Group – Share solutions and strategies.

- Students to present their solutions and strategies and compare them.
- Reveal the solution in Act 3 video. http://gfletchy3act.wordpress.com/peas-in-a-pod/
- Lead discussion to compare these, asking questions such as:
    - How reasonable was your estimate?
    - Which strategy was most efficient?
    - Can you think of another method that might have worked?
    - What might you do differently next time?

FORMATIVE ASSESSMENT QUESTIONS

- What models did you create?
- What organizational strategies did you use?
- What does your model (do your models) represent?

DIFFERENTIATION

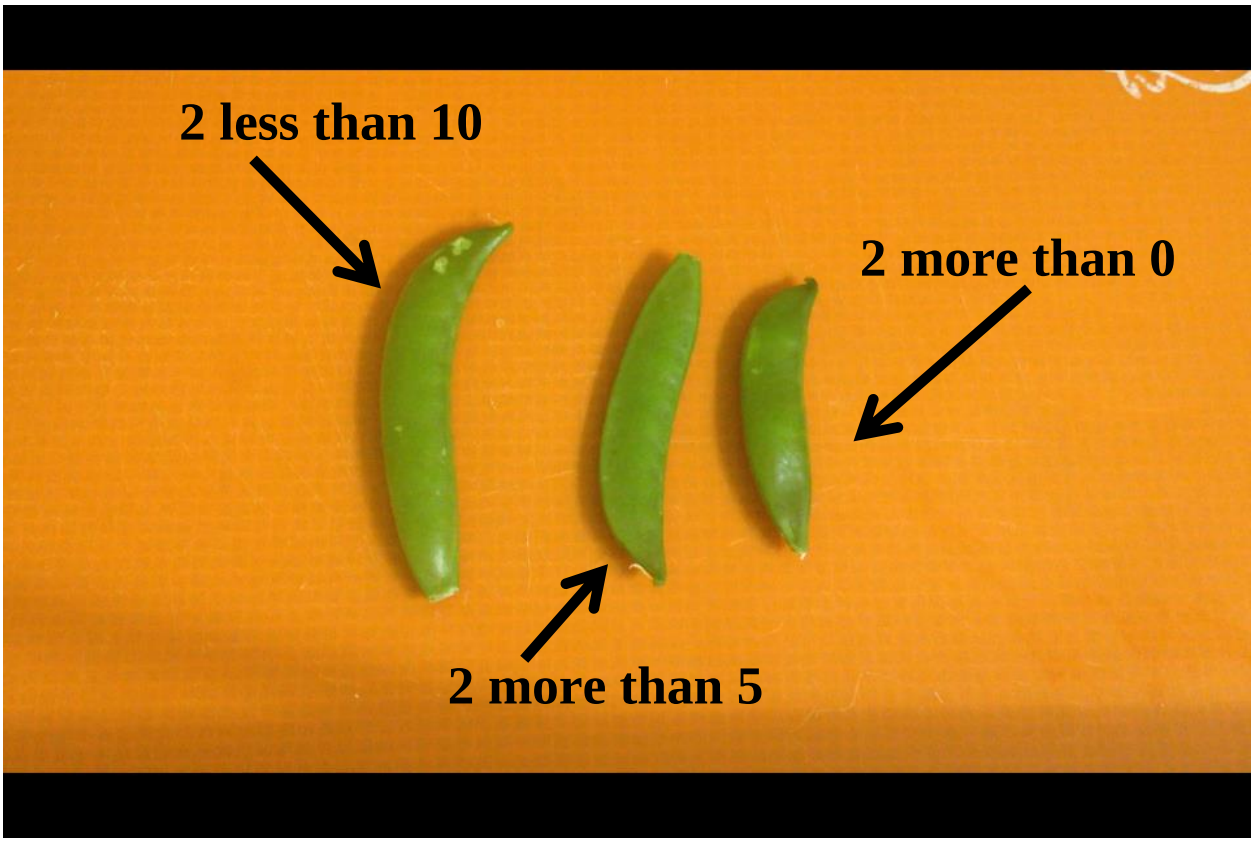
Extension

Allow students to create their own combination of peas in the pod by allowing them to come up with different numbers of peas in each of the three pods to equal a teen number.

Intervention

Allow students to use manipulatives and a ten –frame to represent the peas in the pod and how many peas are all together.
Back to the Intervention Task Table

Act 2



SCAFFOLDING TASK: Got Dots Revisited (11-20) Back to Task Table

Approximately 2-3 days.

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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.CC.5 Count to answer 'how many?" questions.

a. Count to answer "how many?" questions about as many as 20 things arranged in a variety of ways (a line, a rectangular array, or a circle), or as many as 10 things in a scattered configuration.
b. Given a number from 1-20, count out that many objects.

MGSEK.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.

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

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)

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

- Why is counting important?
- 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/or 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.(SMP 1,2,3,4,5,6,7)

- **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 or backwards.*(SMP 1,3,6,8)

- **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).*(SMP 1,3,6,8)

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.*(SMP 1,3,5,6,8)

- **Dot-Card Train:** Make a long row of dot cards from 11-19(SMP1,3,6,8)

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

TEACHER REFLECTION QUESTIONS

- Are students able to count dots with one to one correspondence?
- Are students able to rote count correctly?
- Are students able to use math terminology to explain their counting strategy? (skip counting, etc.)
- Are students able to identify the nearest benchmark number for their answer?
- Are students able to identify a pattern within the grouping of the dots?

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

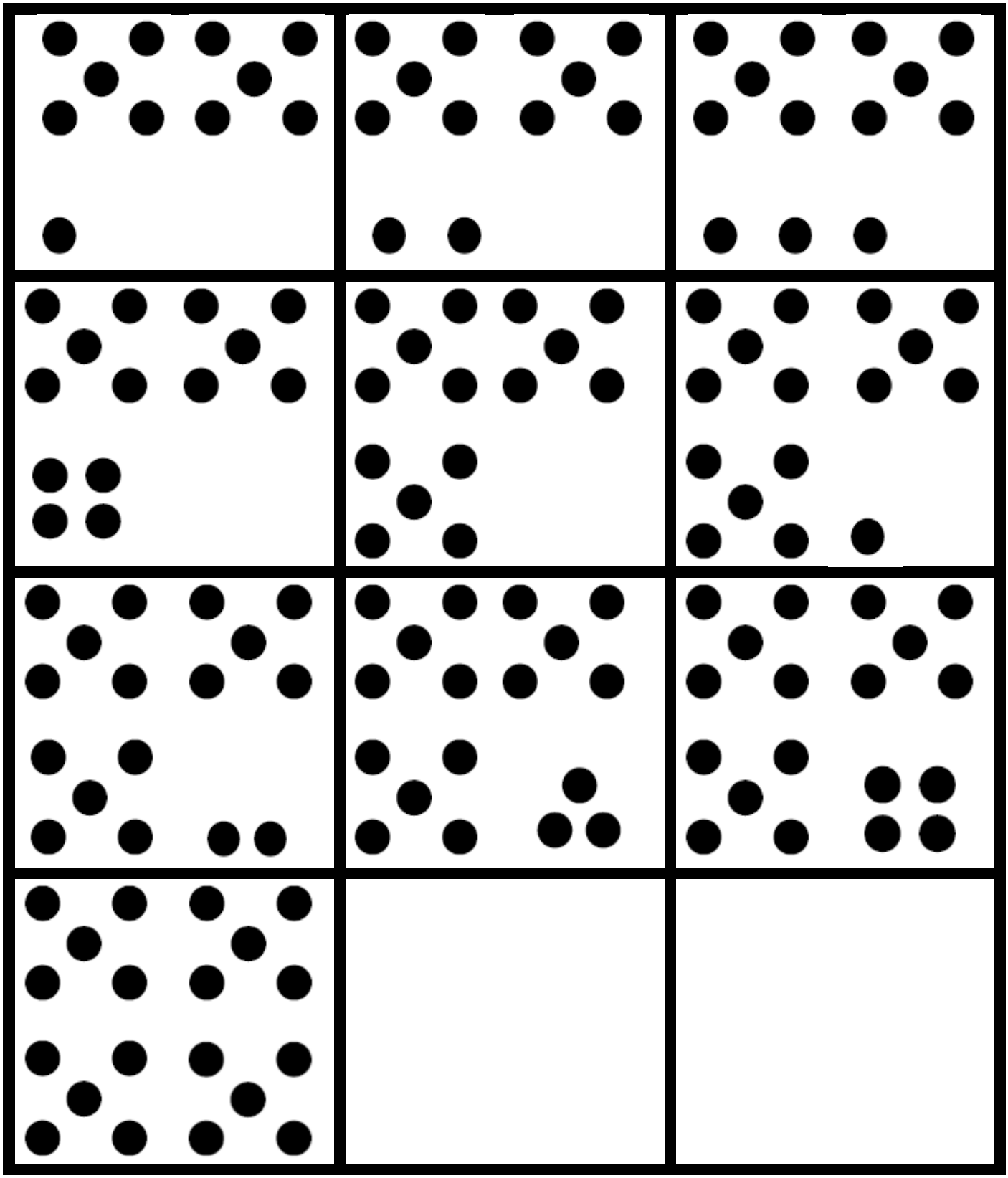
- Increasing or decreasing the quantity of dots on a card can help with differentiating subitizing activities.

Back to the Intervention Task Table

TECHNOLOGY

Scrambled Egg City
http://www.mhschool.com/math/mathconnects/assets/asset_view.html?s=SEC_K_07C&type=SEC
Students match numerals to quantities with numbers 11-20.

Place Value Fruit Shoot (easy)
http://www.sheppardsoftware.com/mathgames/placevalue/fruit_shoot_place_value.htm
Students match quantities to numerals with numbers 11-20.



SCAFFOLDING TASK: Numerals-Pictures-Words (11-19) Back to Task Table

Approximately 1-2 days

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.
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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.CC.1 Count to 100 by ones and by tens.

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

MGSEK.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).

MGSEK.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.(one-to-one correspondence)
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. (cardinality)

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.

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

- How can numbers be represented?
- What is an efficient strategy for counting teen numbers?

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. (SMP1,2,3,6,7,8)

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 least to greatest. 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. (SMP 1,2,3,6,7)

Got Dots: The subitizing activities listed in *Got Dots* can also be included and played with the *Numeral, Picture, Word Cards.*(SMP1-7)

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)

TEACHER REFLECTION QUESTIONS

- Are students able to correctly identify numerals 11-20?
- Are students able to count counters using one to one correspondence?
- Are students able to count on from 10 on the ten frame to identify how many counters in all?
- Are students able to identify how far from 10 a given number is?

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

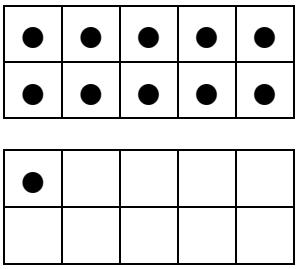
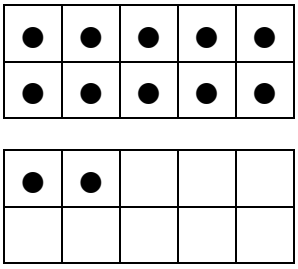
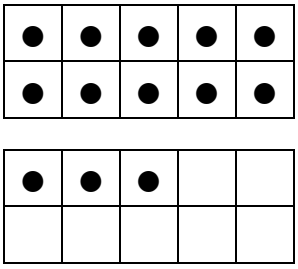
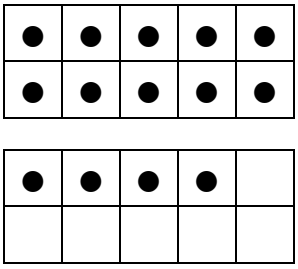
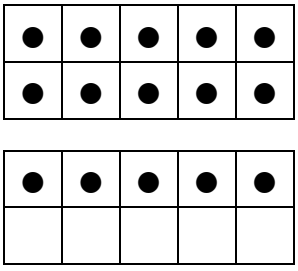
Extension and Intervention

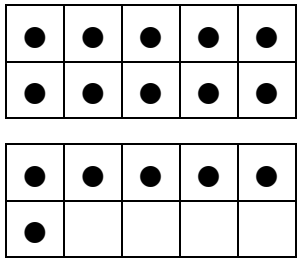
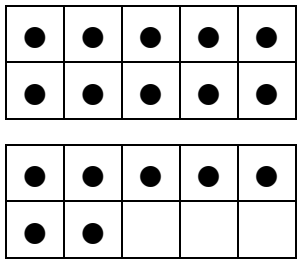
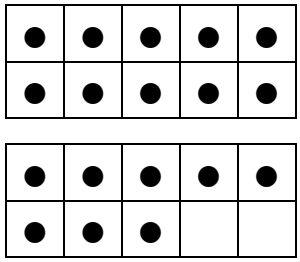
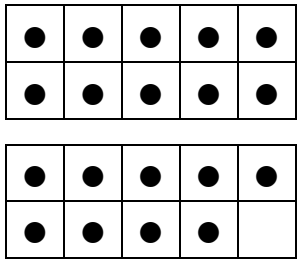
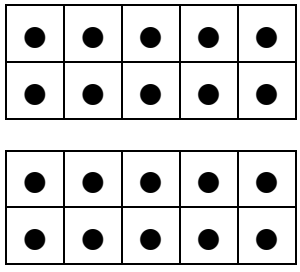
Increasing or decreasing the quantity of dots on a card can help with differentiating subitizing activities.
Back to the Intervention Task Table

TECHNOLOGY

Scrambled Egg City
http://www.mhschool.com/math/mathconnects/assets/asset_view.html?s=SEC_K_07C&type=SEC
Students match numerals to quantities with numbers 11-20.

Connect the Dots to 20
http://www.abcya.com/connect_the_dots_20.htm
Students practice counting numbers while connecting the dots to reveal a picture. Connect the dots by counting 1 to 20.

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	
17	a group of 10 and 7 more	
18	a group of 10 and 8 more	
19	a group of 10 and 9 more	
20	a group of 10 and 10 more	

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

Back to Task Table

Approximately 1 day

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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

MGSEK.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).

MGSEK.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.(one-to-one correspondence)

MGSEK.CC.5 Count to answer "how many?" questions.

a. Count to answer "how many?" questions about as many as 20 things arranged in a variety of ways (a line, a rectangular array, or a circle), or as many as 10 things in a scattered configuration.
b. Given a number from 1-20, count out that many objects.

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)

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

- What is an efficient strategy for counting teen numbers?
- How can numbers be represented?

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.

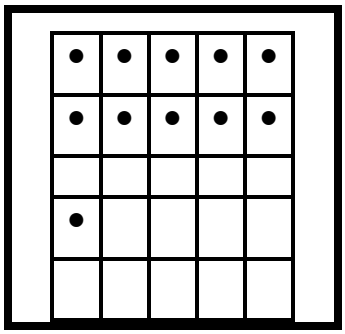
After students share what they know about the number 12, group the students on the floor in pairs and give each pair (2) double ten-frame mats. Have one partner build 11 and the other 12 on the ten-frame mat. Partners should explore and discuss what each number looks like on the double ten-frame and 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.(SMP 1-8)

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 add to the chart. (SMP 1-8)

TEACHER REFLECTION QUESTIONS

- Are students able to create a tower of cubes that matches the given numeral?
- Are students filling the first ten frame completely before putting cubes on the second ten frame?

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.

Back to the Intervention Task Table

TECHNOLOGY

Scrambled Egg City
http://www.mhschool.com/math/mathconnects/assets/asset_view.html?s=SEC_K_07C&type=SEC
Students match numerals to quantities with numbers 11-20.

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

Back to Task Table

Approximately 3 days

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.

STANDARDS FOR MATHEMATICAL CONTENT

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

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

MGSEK.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).

MGSEK.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.(one-to-one correspondence)

MGSEK.CC.5 Count to answer "how many?" questions.

a. Count to answer "how many?" questions about as many as 20 things arranged in a variety of ways (a line, a rectangular array, or a circle), or as many as 10 things in a scattered configuration.
b. Given a number from 1-20, count out that many objects.

MGSEK.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.

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)

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

- What is an efficient strategy for counting teen numbers?
- How can numbers be represented?

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.

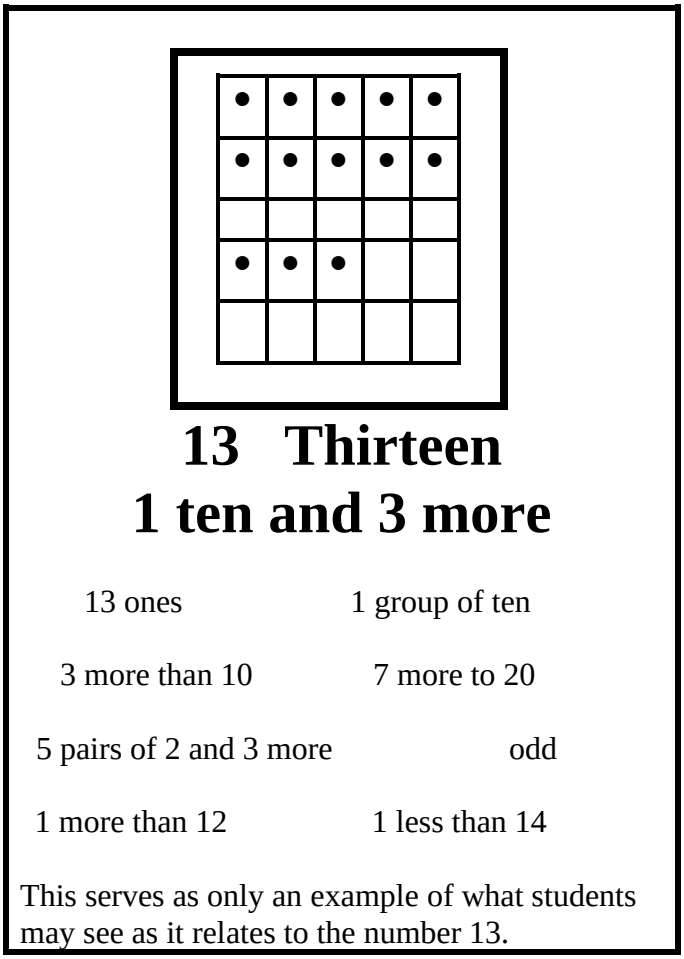
After sharing thoughts about the number 13, show the students the numeral "14". Ask students to make a tower of 14 and repeat the same sequence of questions that were posed for the number 13. Observe which students add 1 cube, the students that keep the tower together and start counting from 1 to 14 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 1.(SMP 1-8)

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.



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.

TEACHER REFLECTION QUESTIONS

- Are students able to create a tower of cubes that matches the given numeral?
- Are students filling the first ten frame completely before putting cubes on the second ten frame?

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.

Back to the Intervention Task Table

TECHNOLOGY

Critter Junction
http://www.mhschool.com/math/mathconnects/assets/asset_view.html?s=CJ_K_07A&type=CJ
Students create quantities to match numerals 11-19.

PRACTICE TASK: Counting Cup

Back to Task Table

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 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.
6. Attend to precision.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

MGSEK.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).

MGSEK.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.(one-to-one correspondence)

MGSEK.CC.5 Count to answer "how many?" questions.

a. Count to answer "how many?" questions about as many as 20 things arranged in a variety of ways (a line, a rectangular array, or a circle), or as many as 10 things in a scattered configuration.
b. Given a number from 1-20, count out that many objects.

MGSEK.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.

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

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

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.

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

- How do you know how many objects you have?
- 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, without moving them. 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. (SMP 1,2,3,4,6)

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.

TEACHER REFLECTION QUESTIONS

- Are students able to provide a reasonable estimate?
- Are students able to count objects using one to one correspondence?
- Are students able to count backwards or forwards to the nearest benchmark number?
- Are students using grouping strategies to count objects quicker?
- Are students able to write numerals correctly?

FORMATIVE ASSESSMENT QUESTIONS

- How many objects 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.

Back to the Intervention Task Table

The Counting Cup

Cup Letter	Estimate	How many in the cup?

CONSTRUCTING TASK: The Cardinal Cup Revisited (11-19) Back to Task Table

Approximately 1-2 days

STANDARDS FOR MATHEMATICAL CONTENT

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

MGSEK.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.(one-to-one correspondence)
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. (cardinality)

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)

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

- Why do I need to be able to count objects?

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
- paper to record numbers

GROUPING

Whole group and/or partners

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I (counting forward)

Students use the task cards from *Numerals, 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. (SMP 1-8)

Part II (counting forward and/or backwards)

Students use the task cards from *Numerals, 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. (SMP 1-8)

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?)

TEACHER REFLECTION QUESTIONS

- Are students able to count forward or backward from a given number?
- Are students able to identify the nearest benchmark number for a given number?
- Are students able to mentally retain the number of cubes in the cup after the 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

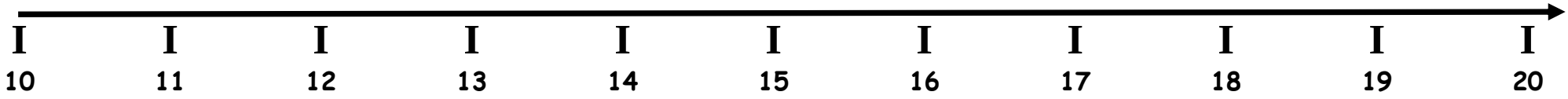
- Ordinal numbers and understanding of positional words can be introduced or revisited through teacher questioning.
- Only using two different colored cubes would allow students to count while creating a pattern. (Example: 1st cube red, 2nd cube blue, 3rd cube red, etc…)

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.

Back to the Intervention Task Table

The Cardinal Cup



Player 1 Scoreboard

Player 2 Scoreboard

PRACTICE TASK: Make Sets of Less/Same/More

Back to Task Table

Approximately one day (Adapted from Van de Walle's activity 2.1)

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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

MGSEK.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.(one-to-one correspondence)

MGSEK.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.

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.

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

- How might you recognize the number of dots on a card without counting?

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 and/or 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. (SMP 1-8)

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. (SMP 1-8)

TEACHER REFLECTION QUESTIONS

- Are students able to correctly identify a given numeral?
- Are students able to create a set to match a given numeral?
- Are students able to use the vocabulary of equal, more and less correctly?
- Are students able to explain how they made sets that are more and less than a given numeral?
- Are students able to add and subtract counters to make 10 and 20?
- Are students able to identify how many counters were added and removed to make 10 and 20?

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 greater 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.

Back to the Intervention Task Table

TECHNOLOGY

Number rows 11-20 http://www.cyberkidzgames.com/
Students practice sequencing numerals 11-19

100 Number Chart http://www.abcya.com/one_hundred_number_chart_game.htm
Students practice filling in the 100's chart with its missing numerals.

PRACTICE TASK: One More/Less Than Dominoes Back to Task Table

Approximately one day (Adapted from Van de Walle's Make Sets of More/Less/Same activity 2.10)

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
6. Attend to precision.
7. Look for and make use of structure.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.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.(one-to-one correspondence)

MGSEK.CC.5 Count to answer "how many?" questions.

a. Count to answer "how many?" questions about as many as 20 things arranged in a variety of ways (a line, a rectangular array, or a circle), or as many as 10 things in a scattered configuration.
b. Given a number from 1-20, count out that many objects.

MGSEK.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.

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)

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

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

MATERIALS

- Dominoes

GROUPING

Small Groups and/or 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)*(SMP1,3,6,7)

Part II
A similar game can be played for two less, one more, or two more. (SMP 1,3,6,7)

TEACHER REFLECTION QUESTIONS

- Are students able to identify what numeral is one less or one less than a given numeral?
- Are students able to identify how many pips are on a domino without counting?

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.

Back to the Intervention Task Table

Constructing Task: Riddle Me This?

Back to Task Table

Approximately one day

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
6. Attend to precision.
7. Look for and make use of structure.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

MGSEK.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.(one-to-one correspondence)

MGSEK.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.

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.

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For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

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

MATERIALS

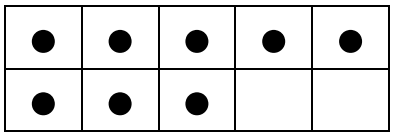
- *Riddle Me This?* task cards
- Single or Double Ten Frame
- Counters

GROUPING

Whole group and/or 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. (SMP 2, 5, 8)

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….

TEACHER REFLECTION QUESTIONS

- Are students able to describe a numeral in multiple ways?
- Are students able to count forward and backward from a given numeral?
- Are students able to identify how far a given numeral is from a given benchmark number?
- Are students able to use math vocabulary such as more and less correctly to provide clues about their quantity for their partner?

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 lesser numerals.
- Use a 5-frame or10-frame riddles to limit the possible answers to the riddle**.**

Back to the Intervention Task Table

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

Back to Task Table

Approximately one day

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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

MGSEK.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).

MGSEK.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.(one-to-one correspondence)

MGSEK.CC.5 Count to answer "how many?" questions.

a. Count to answer "how many?" questions about as many as 20 things arranged in a variety of ways (a line, a rectangular array, or a circle), or as many as 10 things in a scattered configuration.
b. Given a number from 1-20, count out that many objects.

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.

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

- What is an efficient strategy for counting teen numbers?
- How can you know a quantity without counting each object?

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. (SMP 1-8)

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.

TEACHER REFLECTION QUESTIONS

- Are students able to mentally retain the number of cubes in the cup after each count?
- Are students able to count on from a number other than 0 or 1 to find the new amount of counters in the cup?
- Are students able to identify how far the total number of counters is from a benchmark number?
- Are students able to write numerals correctly?

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 your cup?
- If I added 1 more how many would be in your cup?
- 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 quantity of counters used. In addition, the number of rolls used could be limited to 2.

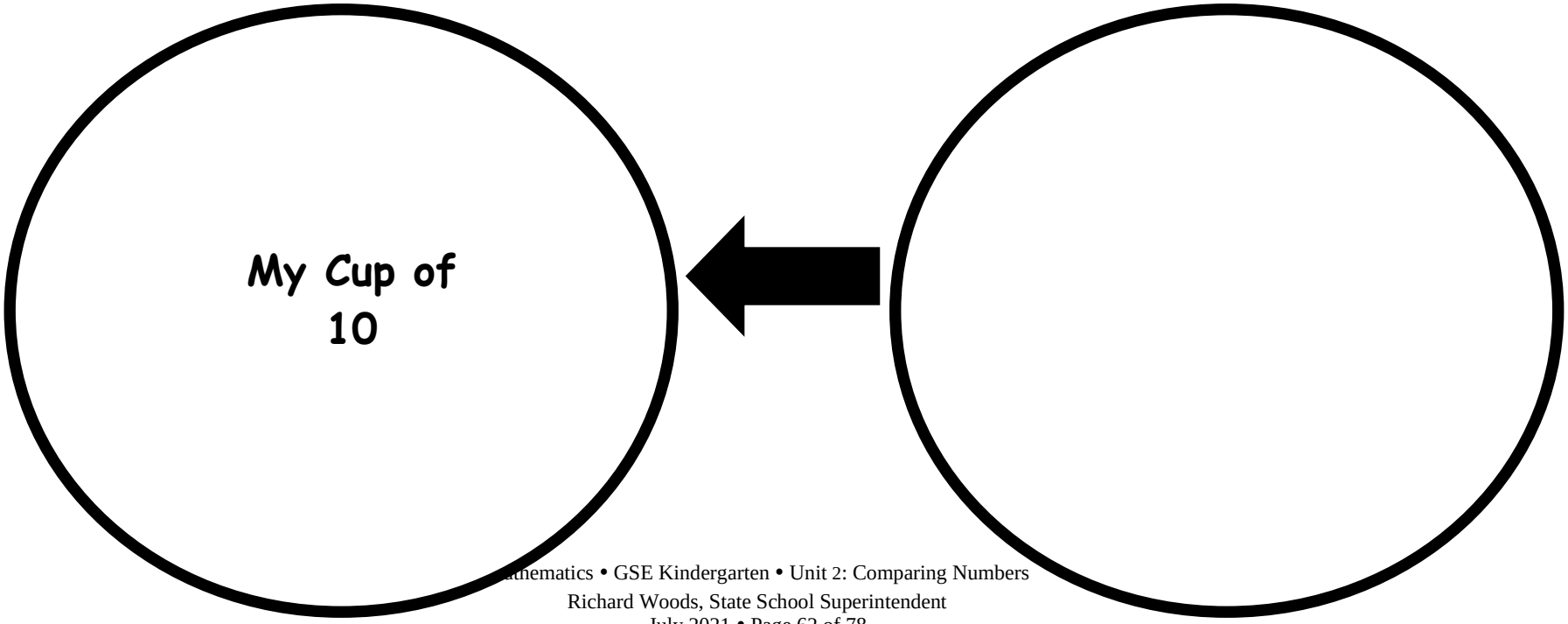
Back to the Intervention Task Table

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.



Moving a Cup of 10

1st Roll	2nd Roll	3rd Roll	I have….

Constructing Task: Make a 10 and Carry On

Back to Task Table

Approximately one day

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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

MGSEK.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).

MGSEK.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.(one-to-one correspondence)

MGSEK.CC.5 Count to answer "how many?" questions.

a. Count to answer "how many?" questions about as many as 20 things arranged in a variety of ways (a line, a rectangular array, or a circle), or as many as 10 things in a scattered configuration.
b. Given a number from 1-20, count out that many objects.
c. Identify and be able to count pennies within 20. (Use pennies as manipulatives in multiple mathematical contexts.)

MGSEK.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.

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

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

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).

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

- What is an efficient way to count an amount greater than ten?

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 and/or 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. (SMP 1-8)

Part II
Play the same way as part one except players roll 4 times then compare to see which player has the greater number. (SMP 1-8)

TEACHER REFLECTION QUESTIONS

- Are students able to make a set of pennies or cubes to match the number on the die?
- Are students able to make a group of ten and add on to make a teen number?

FORMATIVE ASSESSMENT QUESTIONS

- What is an efficient way to count greater 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. This provides practice counting backwards 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.

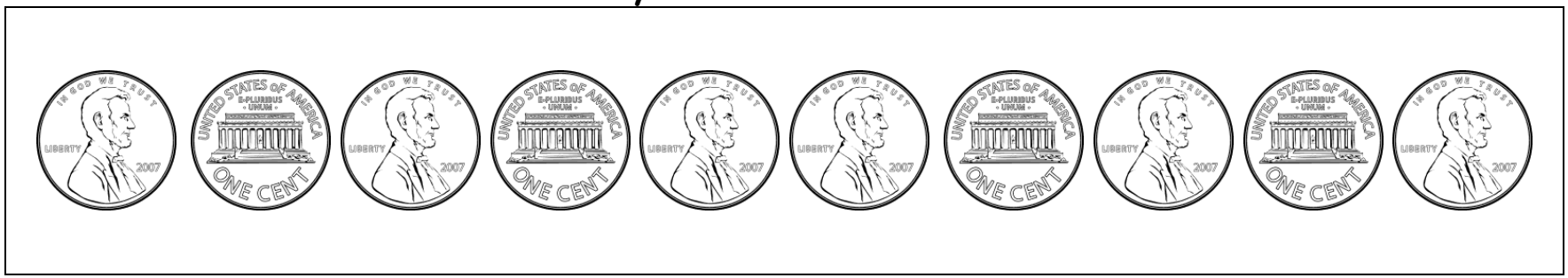
Back to the Intervention Task Table

Make a 10 and Carry On

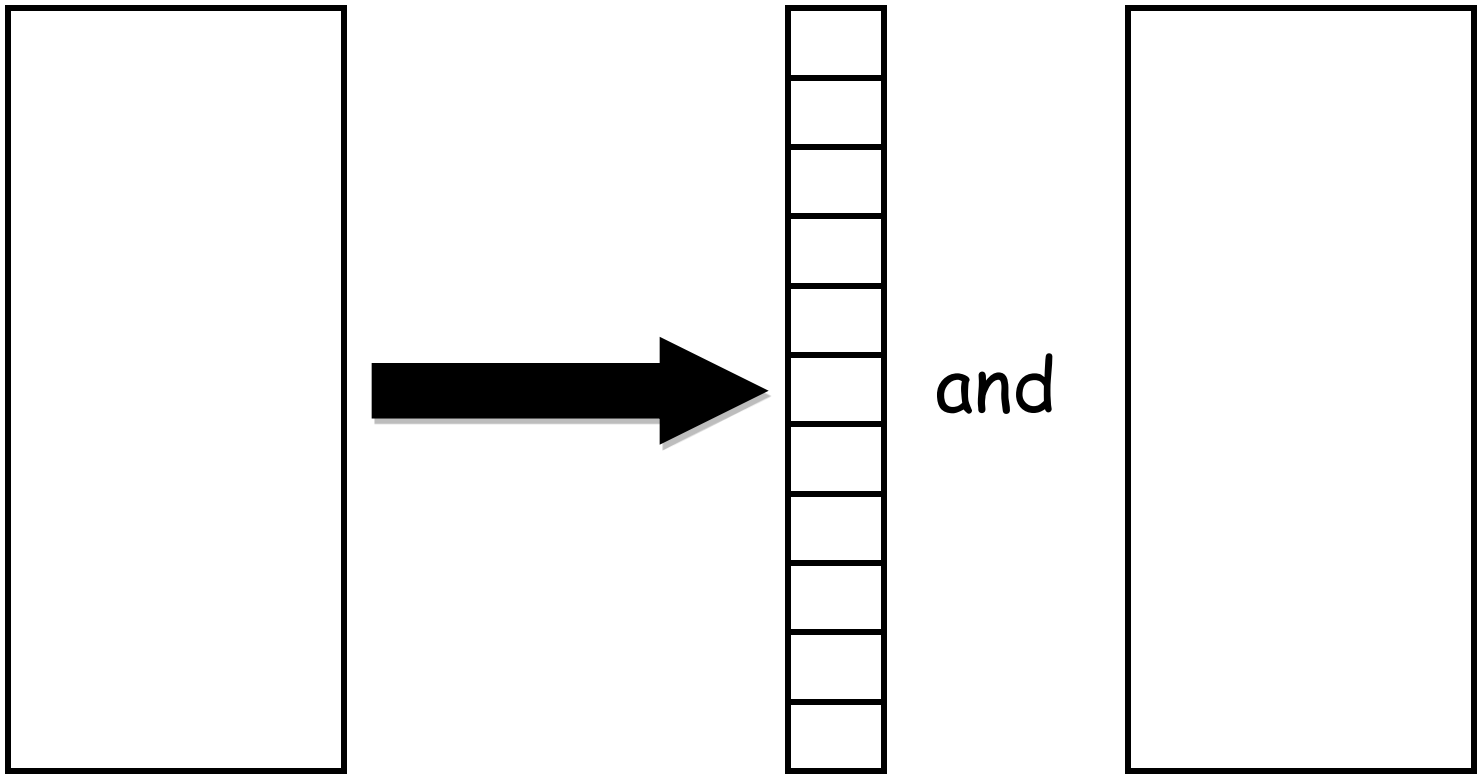
Making My Ten

group 10 ones into 1 group of ten

My Ten and Some More



Make a 10 and Carry On



I have ____ ones which make _____

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

Constructing Task: Race to 100 Pennies

Back to Task Table

Approximately one day

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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

MGSEK.CC.1 Count to 100 by ones and by tens.

MGSEK.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.(one-to-one correspondence)

MGSEK.CC.5 Count to answer "how many?" questions.

a. Count to answer "how many?" questions about as many as 20 things arranged in a variety of ways (a line, a rectangular array, or a circle), or as many as 10 things in a scattered configuration.
b. Given a number from 1-20, count out that many objects.
c. Identify and be able to count pennies within 20. (Use pennies as manipulatives in multiple mathematical contexts.)

MGSEK.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.

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.

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

- How do we use counting in our everyday lives?
- What is an efficient way to count an amount greater than ten?

MATERIALS

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

GROUPING

Whole group/Partner

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Give each student a ten-frame piggy bank sheet. Model for the students how you can fill the ten-frames with up to ten pennies. Show the students that this is equal to one dime (entertain conversation about this also being equal to two 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. (SMP 1-8)

TEACHER REFLECTION QUESTIONS

- Do students understand that ten pennies is worth the same as one dime?
- Are students able to tell how many more than ten a given teen number is?
- Are students able to skip count by 10s to determine how much money is in their piggy bank?

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

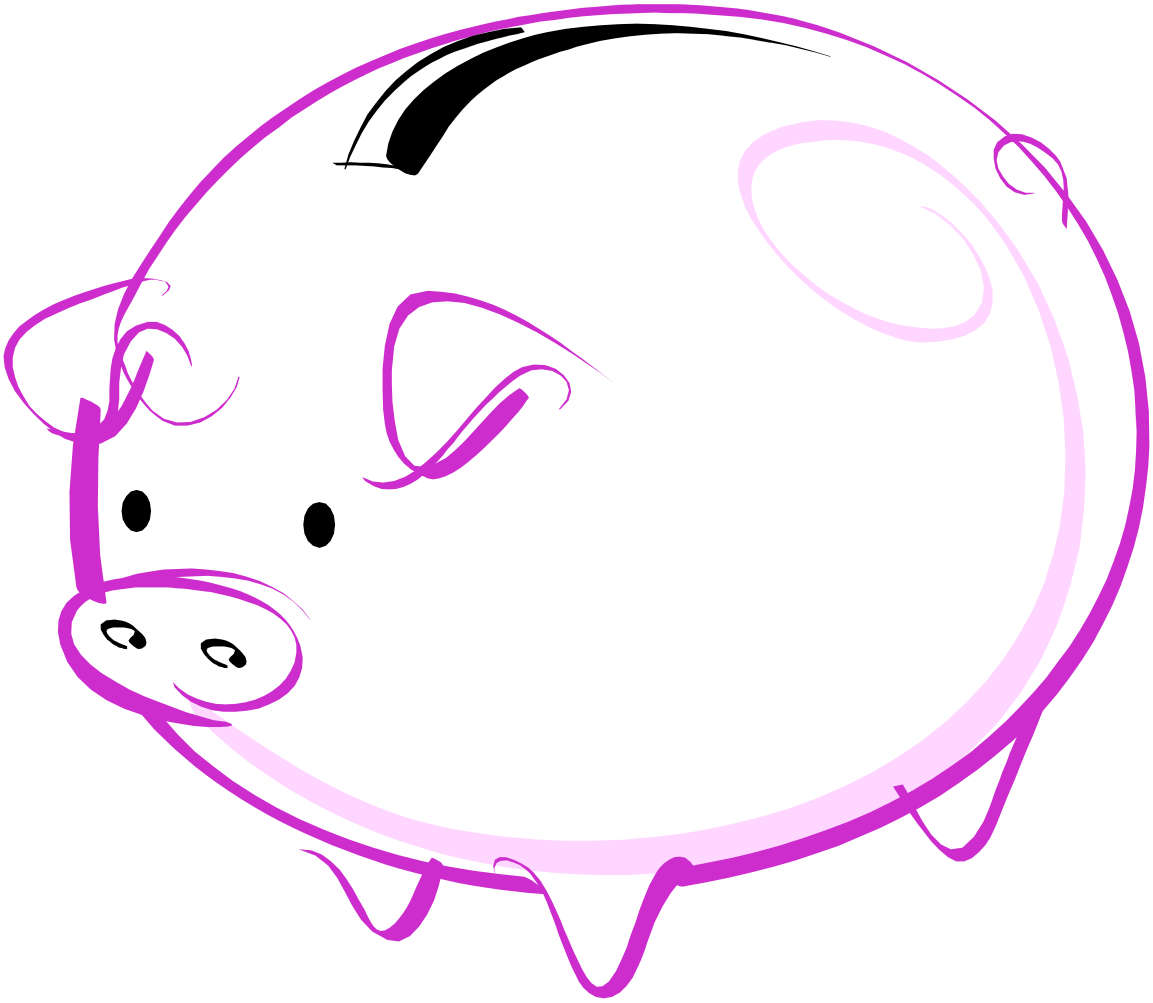
- Use "Math Talk" Cards to verbalize the amount. "I have _____ pennies. I can trade_____ pennies for a _____.
  I won the game because I had _____ more.

Back to the Intervention Task Table

Math Talk Cards http://www.stenhouse.com/assets/pdfs/mathstations_guide.pdf
Teaching resource: Debbie Diller's Moving Into Math Stations K-2

Roll for a Dime

2 Nickels for a Dime



CULMINATING TASK: TEN AND SOME MORE Back to Task Table

Approximately one day (Adapted from Van de Walle's Ten and Some More activity 2.26)

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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones to understand that these numbers are composed of ten ones and one, two, three, four, five, six , seven, eight, or nine ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)

MGSEK.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).

MGSEK.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. (one-to-one correspondence)

MGSEK.CC.5 Count to answer "how many?" questions.

a. Count to answer "how many?" questions about as many as 20 things arranged in a variety of ways (a line, a rectangular array, or a circle), or as many as 10 things in a scattered configuration.
b. Given a number from 1-20, count out that many objects.
c. Identify and be able to count pennies within 20. (Use pennies as manipulatives in multiple mathematical contexts.)

MGSEK.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.

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

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

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.

For more information about common misconceptions refer to the unit overview.

ESSENTIAL QUESTIONS

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 culminating 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 culminating task, it could be extremely beneficial to document students' responses to the formative assessment questions as they can be recognized as summative at this time.

Place each bag at a station or in a central location in the 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.) (SMP 1-8)

Bag	How many groups of 10 can you make?	How many singles are left over?	Number of items in the bag	Closer to 10, 15, or 20? How far away?
Sample	1	4	14	**10 15 20** __1_

As students work through this task, they complete the following list of tasks and record their findings on the task sheet:

1. Empty the contents of the bag into 1 pile.
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. Is the number of items closer to 10, 15 or 20? How far away is the number from the nearest benchmark?

TEACHER REFLECTION QUESTIONS

- Are students able to identify how many more than 10 a given teen number is?
- Are students able to identify the closest benchmark number for a given number?
- Are students able to write teen numerals correctly?

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 closest to 10, 15 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 15? Closest to 20?
- Which bag had the most? Least?

DIFFERENTIATION

Extension

- Give the students a greater 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 more and less 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.

Back to the Intervention Task Table

Ten and Some More

Name:_____

Bag	How many groups of 10 can you make?	How many singles are left over?	Total in the bag	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 _____