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

Approximately 1 day

STANDARDS FOR MATHEMATICAL CONTENT

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

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

MCCK.CC.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

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

a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

MCCK.CC.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

STANDARDS FOR MATHEMATICAL PRACTICE

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

BACKGROUND KNOWLEGDE

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

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

ESSENTIAL QUESTIONS

- What is an efficient strategy for counting teen numbers?

MATERIALS

- Connecting cubes

GROUPING

Whole group/Individual/Pairs

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

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

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

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

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

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

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

build up from 1. Allow students to share their strategies for making a tower of 12. Identify the most efficient strategy.

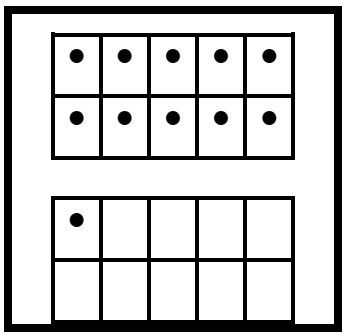
After students share what they know about the number 12, group the students on the floor in pairs and give each pair (2) double ten-frame mats. Have one partner build 11 and the other 12 on the ten-frame mat. Partners should explore and discuss what each number looks like on the double ten-frame and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

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

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

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

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



11

1 group of ten and 1 more

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

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

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

FORMATIVE ASSESSMENT QUESTIONS

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

DIFFERENTIATION

Extension

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

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

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

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

Intervention

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