CONSTRUCTING TASK: Dropping Tens

Approximately 3-4 days (Adapted from Van de Walle activity 5.1)

STANDARDS FOR MATHEMATICAL CONTENT

MCC1.NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

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

Place-value requires the understanding of grouping by tens and how groups are recorded in our place-value system, how numbers are written, and how they are spoken. We want children to recognize that making groupings of tens and left-overs is a way of counting the same quantity by ones. (Van de Walle, p. 124)

ESSENTIAL QUESTIONS

- What is an effective way of counting a large quantity of objects?
- How can we represent a number with tens and ones?
- What are math tools and how can they help me make sense of numbers and counting?
- How do we know if a set has more or less?
- How can we use counting to compare objects in a set?

MATERIALS

- 25-100 piece collection of dried beans
- Tongue depressors
- School glue
- Dot sticks (craft sticks/popsicle sticks)

GROUPING

Large Group/Individual/Partner

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I
Gather the students together for a class discussion on ways to represent a number. Dump the collection of beans on the floor, and ask the students to count the beans. Have students share their method of counting the beans. Note: *Having the students group items in groups of ten is the most efficient means to count the items. However, this strategy needs to be found by the students and not prompted by the teacher*. Continue the discussion after the number of items on the floor is determined. Ask the students how this number could be represented. (Example: How can we represent the number 54?) Chart the students' responses and ideas. Continue the class discussion until the students understand that when representing the number 54, there are five sets of ten and 4 ones left over. Note: Some students may say 4 sets of ten and 14 ones.

Part II
Show students how to make base-ten models by gluing ten beans on each tongue depressor to represent one group of ten. Have them work independently, to make the base-ten models until all the possible groups of ten beans are used.

Comment: Bean sticks are an excellent way to connect unitizing to base-ten blocks and should be used interchangeably. Physical models for base-ten concepts helps students to develop the idea of "a ten" as both a single entity and as a set of 10 units. (Van de Walle, p. 127)

Part III
Comment: Prior to this activity, the teacher should make dot sticks to represent the base-ten model. To make dot sticks, place a set of ten dots on one side of the stick and one dot on the reverse side of the stick. This will allow students to represent both tens and ones.

Gather students in a common area to introduce the dot sticks and to play Dropping Tens. Students will be given ten dot sticks each. The students will drop the ten sticks to see what combination of tens and ones are created. The students will then record the number created on their recording sheet. Please refer to the key at the bottom of the recording sheet to explain to students how to record their number.

Part IV
Gather the students in a common area to explain the *Who Has More?* game. With students in pairs, player one drops their group of ten sticks and records their number on the game board. Then, player two drops their group of ten sticks and records their number on the game board. The player with the most circles their number. Play continues until each player has gone 5 times. The player with the

most groups circled wins. If there is a tie, students must count up all the ones recorded to determine the winner.

FORMATIVE ASSESSMENT QUESTIONS

- How many beans were counted? How many tens? How many ones?
- How can a set of ten be represented?
- How can ones be represented?
- What is the smallest number that could have been made with your dot sticks?
- What is the largest number that could have been made with your dot sticks?

DIFFERENTIATION

Extension

- Have students model their number with base-ten blocks.
- Have students place the numbers they created in order from least to greatest.

Intervention

- Have the students use fewer sticks to play Dropping Tens.
- Have students model their number dropped with the bean sticks.

Dropping Tens

Name:_____

Sticks of 10 and some more	Numeral
I I I I I I I ● ● ●	73

Key

I -is equal to 10 beans ● is equal to 1 bean

Who Has More?

Player 1 Name:	
Sticks of 10 and some more	**Numeral**
lllllll•••	

Player 2 Name:	
Sticks of 10 and some more	**Numeral**
llll••••••	46

Key

l -is equal to 10 beans • is equal to 1 bean