CONSTRUCTING TASK: Building Towers of 10

Approximately 2-3Days

STANDARDS FOR MATHEMATICAL CONTENT

MCC.2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

MCC.2.OA.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

MCC.2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

STANDARDS FOR MATHMATICAL 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.

*****Mathematical Practices 1 and 6 should be evident in EVERY lesson. *****

BACKGROUND KNOWLEDGE

This task is focused on students counting collections of objects in sets of ten and using their understanding of place value to record larger amounts. At first students will build up to 100, They need a dozen or so experiences playing the Building version (addition) **BEFORE** doing the Busting version (subtraction).This is not intended to introduce the strategy of regrouping to students. These games are designed to give students the opportunity to experience the "action" of addition and the "action" of subtraction and how these two actions are opposite (inverse) operations. As established in Unit 1, in this task the students are building a true foundation for their number knowledge by decomposing and composing groups ten.

ESSENTIAL QUESTIONS

- How does using 10 as a benchmark number help us add or subtract?
- How do we represent a collection of objects using tens and ones?

MATERIALS

- Unifix cubes-100 per partner set (or you could use base ten blocks)
- 2 number cubes (One labeled 1-6, another labeled 4-9) for each pair of students
- Place Value Mat
- Paper

GROUPING

Partners

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Task Directions for Building (Addition Version)-
Students work with a partner and play the "Building to 100" game. Students take turns tossing both number cubes and adding the numbers on each cube. Then the player who rolled the number cubes collects that many objects. Students should use their place value mats to manipulate the number. This amount is added to the existing collection of cubes in towers of 10. Together partners determine their new total and record this number on a sheet of paper. Before each toss, the player must tell the total number of cubes, counting by 10s and 1s. Partners continue rolling and collecting objects until they create a collection of 100 cubes – ten towers of 10.

Task Directions for Busting (Subtraction Version)-
Students work with a partner and play the "Busting100" game. Have students play backwards from 100 to 0. Students begin with ten groups of 10 cubes and break apart the groups to remove the sum of the dice they rolled. This time the mat begins with ten towers of ten already on it. Using connecting cubes is suggested so that students can unsnap (bust) the towers as needed. Students take turns tossing both number cubes and adding the numbers on each cube. Then the player who rolled the number cubes takes that many off of the mat. Students should use their place value mats to represent the number. This amount is taken away from the existing collection of cubes in towers of 10 and ones that are on the mat. Together partners determine their new total and record this number on a sheet of paper. Before each toss, the player must tell the total number of cubes, counting by 10s and 1s. Partners continue rolling and taking off cubes until they have reached zero cubes.

FORMATIVE ASSESSMENT QUESTIONS

- What did you do to figure out how many blocks to add/subtract each time?
- What strategies were you using to add/subtract the numbers on the dice?

- How did you know your total was correct or not each time?
- Show me 74 on your mat. How is that amount different from 47? How is it the same?

DIFFERENTIATION

Extension

- Have students work beyond 100, up to two hundred recording the amounts. Encourage students to try and write an equation expressing what they are doing on each turn/roll.
- Have students use a 100's chart instead of manipulatives. Students would have to state what number they currently have and how far they have until they reach their "goal"

Intervention

- Have students build collections to 50 and use 2 (1-6) number cubes.

For students having difficulty with the subtraction part of the task use the version of the game located at this NCTM website where they begin with 20 instead of 100.
http://illuminations.nctm.org/LessonDetail.aspx?ID=L43