CONSTRUCTING TASK: Cookie Monster

Approximately 1-2 Days

STANDARDS FOR MATHEMATICAL CONTENT

MCC2.OA.3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

MCC2.OA.4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

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.

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

BACKGROUND kNOWLEDGE

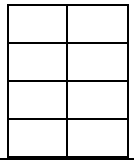
(Information adapted from North Carolina DPI Instructional Support Tools)
The standard addressed in this task calls for students to apply their work with doubles addition facts to the concept of odd or even numbers. Students should have ample experiences exploring the concept that if a number can be decomposed (broken apart) into two equal addends (e.g., 10 = 5 +5), then that number (10 in this case) is an even number. Students should explore this concept with concrete objects (e.g., counters, place value cubes, etc.) before moving towards pictorial representations such as circles or arrays.

Example: Is 8 an even number? Prove your answer.

Student 1	**Student 2**
I grabbed 8 counters. I paired counters up into groups of 2. Since I didn't have any counters left over, I know that 8 is an even number.	I grabbed 8 counters. I put them into 2 equal groups. There were 4 counters in each group, so 8 is an even number.

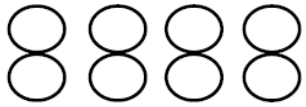
Student 3

I drew 8 boxes in a rectangle that had two columns. Since every box on the left matches a box on the right, I know 8 is even.



Student 4

I drew 8 circles. I matched one on the left with one on the right. Since they all match up, I know that 8 is an even number.



Student 5 I know that 4 plus 4 equals 8. So 8 is an even number.

Example: Is 7 an even number? Prove your answer.

Student 1

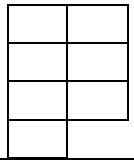
I grabbed 7 counters. I paired counters up into groups of 2. Since I had 1 counter left over, I know that 7 is NOT an even number. It is an odd number

Student 2

I grabbed 7 counters. I tried to put them into 2 equal groups. There were 4 counters in one group and 3 in the other group. I know that 7 is NOT an even number. It is an odd number.

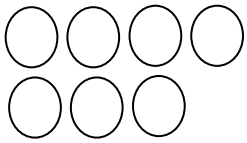
Student 3

I tried to draw a rectangle with 7 boxes. Every box on the left did not match a box on the right, so I know7 is NOT an even number. It is an odd number.



Student 4

I drew 7 circles. I matched one on the left with one on the right. Since they all do NOT match up, I know that 7 is NOT an even number. It is an odd number



Student 5 I know that 4 plus 3 equals 7. It is not a double fact, so 7 is NOT an even number. It is an odd number.

ESSENTIAL QUESTIONS

- What is an array?
- What is repeated addition?
- How are arrays and repeated addition related?
- How does skip counting help us solve repeated addition problems?

- How can we model repeated addition equation with an array?
- How are arrays used in our daily lives?

MATERIALS

- Counters, square tiles, other manipulatives
- Cookie Monster Student Recording Form
- *Stacks of Trouble* by Martha F. Brenner

GROUPING

Small Group

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I
Review the concepts of arrays by reading *Stacks of Trouble* by Martha F. Brenner aloud to the class. With each situation have students discuss how the dishes are stacked to create an array.

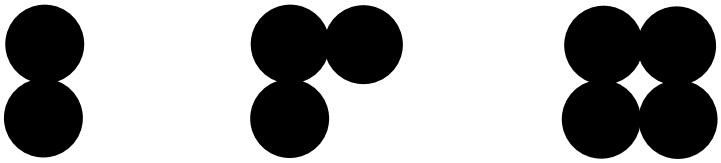
Part II
In small groups or partners, present the student with this task:

The cookie monster loved cookies. Every 3rd day he would take out one more cookie than he did the previous time. Each time before eating the cookies, he would line them up on the table and make an array with only two rows.

On the first day, the cookie monster had 2 cookies and he was able to build his array with two equal rows. On day 4, he had 3 cookies but he couldn't make an array with two equal rows. If the pattern continued 9 more times, on what days would the cookie monster be able to make an array with his cookies using only two rows? Show and explain your mathematical thinking.

Row 1

Row 2



Day 1 *Day 4* *Day 7*

Be sure to describe and explain any patterns you recognize. Can you make a rule?

Part III
When students have completed the task, have them explain their rule on chart part and share with the class. Students will vary in their explanations, which should give the teacher a better understanding of their misconceptions.

FORMATIVE ASSESSMENT QUESTIONS

- What arrays do you see?

- How can we create an equation for this?
- What are you noticing about the pattern?
- How are the days similar? How are they different?

DIFFERENTIATION

Extension

- Have students create their own cookie monster pattern that alternates between even and odd, but this time the Cookie Monster takes more than one cookie. How many cookies will he take?

Intervention

- Allow students to use circular counters to manipulate to better understand that variety of arrays.
- Allow students to use grid paper to ensure that their representation of the pattern is correctly aligned.

Name: _____

Me Love Cookies

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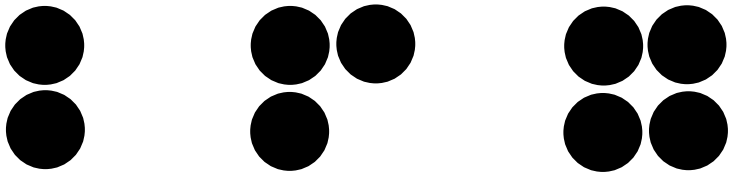

Day 1 Day 4 Day 7

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