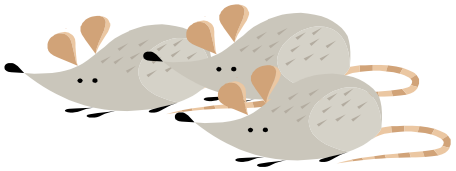
Constructing Task: Counting Mice



Approximately 2-3 Days

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

(Information quoted from Van de Walle and Lovin, Teaching Student-Centered Mathematics: Grades K-3, pages 68)

"Notice that in the separate problems, the initial amount is the whole or the largest amount, whereas in the join problems, the result was the whole. Again refer to Figure 3.1 as you consider these problems. Be sure you can identify what quantities are the initial, change, and result amounts."

ESSENTIAL QUESTIONS

- How can we solve subtraction problems with and without regrouping?
- How can addition help us know if we subtracted two numbers correctly?
- How can I use a number line to help me model how I combine and compare numbers?

MATERIALS

- *Mouse Count* by Ellen Stoll Walsh or similar counting book
- "Counting Mice" recording sheet

GROUPING

Partners

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Some Subtraction Types		
Problem Type	Action or Situation	Number Sentence
Separate, result unknown	Snake has 42 mice in the jar. 17 escape. How many are left?	42 – 17 = ?
Separate, start unknown	Snake has some mice in the jar. 17 escape. 25 are left. How many did he have at the start?	? – 17 = 25
Separate, change unknown	Snake has 42 mice in the jar. Some escape. 25 are left. How many escaped?	42 – ? = 25

Part I
Read the book *Mouse Count* by Ellen Stoll Walsh or a similar book to the class. While reading ask students to think about how they could act out the story using place value blocks, model it on the number line, and/or show how it could be solved using a 99's chart. Once you finish reading the story post this scenario on the board:

Snake was very hungry one day and put 25 mice in the jar before he took a nap. He put 17 more mice in the jar after his nap. How many mice are in the jar all together?

Have students go back to their desk to figure out how many mice are in the jar altogether. Provide paper, pencils, and crayons available for the children to use to help them solve their problem. Also allow students to use a 99's chart or a number line to model their thinking. Have students work alone at first for a few minutes, but sitting in groups to observe and discuss each other's strategies after having a few minutes to work independently. As students work, look for a variety of strategies and/or solutions. Before asking students to share, plan which solutions should be shared and in which order they should be shared. In this way students are exposed to strategies/solutions that would add to students' understanding of numbers and solving problems. After students have had an opportunity to finish their work, let several children share the strategies they used. Create a class chart to document the strategies.

25 + 17
Strategies We Used

(a) I counted on from 25 (25 . . . 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42)
(b) 20 +10 is 30, and 5+7 is 12, and 30 + 12 is 42
(c) 25 +10 is 35, plus 5 more is 40, plus 2 more is 42
(d) I took 5 away from the 17 and made 25 into 30. Then I added 12 (from the 17 – 5) and got 42
(e) I drew circles (00000000000000000000000 00000000000000000)
25 17

Be sure to ask questions like the following for formative student assessment:

How did you solve the problem?
Can you write a number sentence (make a picture, make a model) that shows your thinking
How do you know your answer is correct?
Can you solve this problem in a different way?
Are you able to use the number line to model how you solved this problem?

Part II
After reading, acting out and modeling the story, explain to the children that you have made up a new version of the story about Snake. Gather the students together and say
"Snake was very hungry one day and put 25 mice in the jar before he took a nap. He put 18 more in after the nap. Then he went outside to play. When he came back in there were only 14 mice in the jar! Help Snake figure out how many mice escaped!"

Have paper, pencils, and crayons available for the children to use to help them solve their problem. Remind them that they need to use pictures numbers and words to help show their thinking. Also provide students with a number line, a 99's chart, and place value blocks available for students to use to model their thinking. Have students work alone at first for a few minutes, but sitting in groups to observe and discuss each other's strategies after having a few minutes to work independently. As students work, look for a variety of strategies and/or solutions. Before asking students to share, plan which solutions should be shared and in which order they should be shared. In this way students are exposed to strategies/solutions that would add to students' understanding of numbers and solving problems. After students have had an opportunity to finish their work, let several children share the strategies they used. Make sure to create a class chart to document the strategies as in Part I of this task.

Comment

Look specifically for any students who use a number line or 99's chart to model their work. Make sure to share this strategy with the class. If it is not offered, then demonstrate to the students how you could use a number line or 99's chart (look in Unit Overview for more detailed examples).
A student who uses a 99's chart might say…
"I used a 99's chart. I started at 25. I moved down one row which is 10 more, then moved to the right 8 spots and landed on 43. This represented the 18 more students coming into the cafeteria."

Part III
Hand out the student task sheet *Counting Mice.* Have them work independently to solve the problems on the sheet. Remind students to use pictures, symbols, numbers and words to show how they are thinking about and solving the problems.

FORMATIVE ASSESSMENT QUESTIONS

- What strategy did you use?
- Were you able to write a number sentence, draw a picture, or make a model that shows your thinking?
- Would someone else be able to understand how you thought abut the problem by looking at your work?
- Did you check your answer? How do you know your answer is correct?
- Can you explain how a neighbor solved this problem in a different way?
- How did you decide what to do to solve the problem?
- Are you able to use the number line to model how you solved this problem?

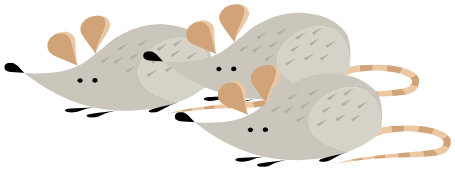
DIFFERENTIATION

Extension
- Have students write another version to the Snake story or other story problems and describe strategies they could use to solve them.

Intervention
- Give students more experiences with regrouping using base ten blocks. Also provide more experiences for them to use the 99's chart and the number line to model the addition and subtraction they are doing.

Name _____ Date _____

Counting Mice



1. Snake was very hungry one day and put 25 mice in the jar before he took a nap. He put 17 more mice in the jar after his nap. How many mice are in the jar all together?

2. Snake has 49 mice and his cousin Rattles has 37 mice. Who has more mice, Snake or Rattles? How many more does he have?

3. Snake and his cousin Rattles put their mice together in one big tank. But then, 17 of the mice escaped. How many mice do Snake and Rattles have now?