CONSTRUCTING TASK: Exploring the 99 Chart

Approximately 3 or more days

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

Students should have experience counting numbers to 100. This may be students' first experience with the 0-99 chart or 1-100 chart. It is important for the students to be exposed to both. However, developmental understanding should happen with a 99 chart. Listed below are several reasons that support use of a 99 chart:

- A 0-99 chart begins with zero where a hundred's chart begins with 1. We need to include zero because it is one of the ten digits and just as important as 1-9.
- A 100 chart puts the decade numerals (10, 20, 30, etc.) in the wrong row. For instance, on a hundred's chart 20 appears at the end of the teens row, where it simply doesn't belong because it is not a teen number. The number 20 is the beginning of the 20's family; therefore it should be in the beginning of the 20's row like in a 99's chart.
- A 0-99 chart ends with the last two digit number, 99, whereas a hundred's chart ends in 100. Again, this is the wrong place for the number 100, it should begin a whole new chart because it is the first three digit number.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

ESSENTIAL QUESTIONS

- What patterns exist on the 99 chart?
- How can number benchmarks build our understanding of numbers?

MATERIALS

- Two 99 charts for each student (optional: demonstration sized chart)
- 99 chart with missing numbers
- Clear counters
- Scissors
- Sandwich size plastic bags
- *Centipede's 100 Shoes* by Toni Ross or similar story

GROUPING

Individual, partners, small group

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I
Gather the students in a common area. Read the story *Centipede's 100 Shoes* by Toni Ross or a similar story. Discuss what happens to the centipede in the story. What do you notice about the number of feet that animals have? (even number of feet….Can you think of any that have an odd number?) Using chart paper, make a list of facts, connections, or ideas that we have learned about with the 99 chart or 100 chart.

Part II
In this task, students will complete a variety of activities with the 99 chart to build a deeper understand for the number sequence. These activities could be presented as centers or a series of small group activities.

Activity 1: Special Numbers! Give each student a set of counters and a 99 chart. Ask each student to cover 3 numbers that are special to them. It could be their age, street address, number of family members, birthday, favorite sport's jersey number, etc. Partner up the student to share their special numbers. Call on a few students to share with the class.

Activity 2: What's My Picture? The teacher will call out numbers or directions and the students will cover the number with a clear counter. Teacher calls out the following numbers: 58, 4, 67, 23, 48, 52, 24, 45, 27, 26, 38, 32, 74, 42, 76, 15, 35, 63, 25. Ask the student what the picture resembles. It should resemble an apple.

Activity 3: All Scrambled Up! Give each student a copy of the 99 chart. Have the students cut up the chart into at least 10 pieces. ***It is very important that the students cut only on the bold lines. They may not cut diagonally through a number.*** Have the students think of this activity as if they are creating a puzzle. Place all the pieces into a sandwich size plastic bag. Trade bags with a partner and put their 99 chart back together in the correct order.

Activity 4: Counting Patterns! Give each student a 99 chart and a set of counters. Begin with the first row of numbers 0-9 and have the students cover the even numbers. Discuss how we know these numbers are even. What do we call the numbers that are not covered in the first row? Now ask the students to cover the even numbers in the second row of numbers 10-19. Repeat with the third row and ask the students if they notice a pattern. Discuss the pattern and have the students predict where the counters will go on the rest of the chart.
If we count the numbers that are covered, what skip counting pattern would we be counting?
Count by two's aloud as a class. Clear the counters and repeat the activity with covering the numbers when counting by 5's and 10's. Discuss the patterns seen on the 99 charts. Practice skip counting by 2's, 5's and 10's as a class.

Activity 5: Who's Missing? Give students a 99 chart with some of the numbers omitted. Tell students to use a math strategy to determine the missing numbers and write each in the appropriate position on their 99 chart. Have students look closely at each number they added to the chart and determine what multiple of ten each number lives closest to. Ask students, "Which ten is my closest friend?" Select a number that was added such as 14. Create an example for finding its closest friend: The multiples of ten that 14 is between are 10 and 20. 14 is 4 spaces from 10 and 6 spaces from 20. So, 14 is closest to ten. Have students pick 5 of the numbers they added to the chart and complete the sentences that describe to which multiple of ten the number is closest.

Part III – Fill the Stairs
Play the game "Fill the Stairs". Each player will need a game board. Students will take turns rolling two 0-9 sided dice or spinner and creating a two digit number. For each turn, the player writes the number created in any space. The object of the game is to keep the numbers in order between 10 and 100, climbing down the stairs. The stairs climb down to resemble the visual of the 99 chart. The numbers start small at the top and get larger as you work down the chart. If there is no space to write a number, that player loses that turn. The student that fills in their stairs first wins. Students may use a 99 chart as a guide if needed. The position of the numbers on the 99 chart gives some students a visual of where the number might be best placed on the stairs.

FORMATIVE ASSESSMENT QUESTIONS

- How do you know the following numbers are in the correct counting sequence?
- How do you know if a number is even or odd?
- What skip counting patterns can you identify on the 99 chart? How do these patterns help you count?

- How can you tell to which ten a missing number is closest?
- Explain why the numbers with a five in the ones place are in the same column. Why aren't the numbers with a five in the tens place in the same column?

DIFFERENTIATION

Extension

- When calling out numbers for the students to cover in "What's My Picture?", use terms like one more than or one less than the number listed. Example: instead of calling out the number 67 to cover, you would say "cover the number one more than 66".
- In "All Scrambled Up!", cut the 99 chart into smaller sections, this will provide more of a challenge for students to put it back together.
- Have students create their own 99 chart that is blank (below) by filling in all numbers. Have them color every number they would say when counting by 2's with yellow. Tell them to describe in their journals the pattern they see. What if you colored all the things you would say when counting by 5's? Color the multiples of 5 orange. What pattern do you see? What if you colored all the numbers you would say when counting by 10's? Color the multiples of 10 red. What pattern do you see? Write 3 interesting things you notice about these different patterns.

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Intervention

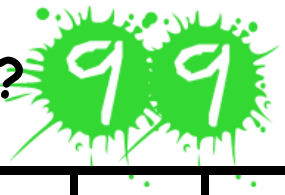
- In "All Scrambled Up!", cut the 99 chart into larger sections, this will make it easier for students to put it back together.

99 Chart

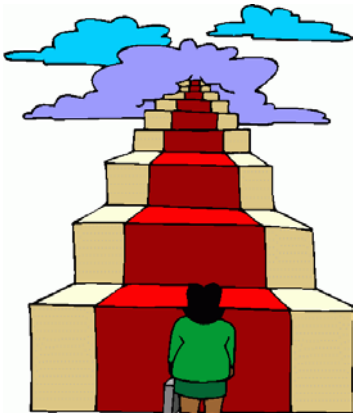
0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

Name _____ Date_____

Who's Missing?



0	1		3	4	5	6	7	8	9
10		12	13		15		17		19
20	21		23	24	25			28	29
	31	32	33		35		37	38	
40			43	44		46	47		49
50	51	52		54	55			58	
	61	62		64	65	66	67		69
70		72	73		75	76		78	
80	81		83		85		87	88	
90	91	92		94	95		97	98	99



Fill the Stairs

Materials: Gameboard, two 0-9 dice or spinners
Directions: Each player will need a game board. Students will take turns rolling the dice and creating a two digit number. For each turn, the player writes the number created in any space. The object of the game is to keep the numbers in order between 10 and 100. If there is no space to write a number, that player loses that turn. The student who fills in their stairs first wins.

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100