SCAFFOLDING TASK: Different Paths, Same Destination

Approximately 2-3 days

STANDARDS FOR MATHEMATICAL CONTENT

MCC1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

a. 10 can be thought of as a bundle of ten ones — called a "ten."
b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

MCC1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

MCC1.NBT.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

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

This game will address many different standards and involve listening and problem solving strategies. Students will apply skills and concepts they have learned throughout the year involving number sense and place value. Students should demonstrate an understanding that the digits 0-9 are used to express or represent an amount or number and the placement of these digits determines the value or size of the number. They should be able to build numbers with an understanding of place value in tens and ones and locate the numbers on a 99 chart.

ESSENTIAL QUESTIONS

- How can different combinations of numbers and operations be used to represent the same quantity?
- How can we use skip counting to help us solve problems?
- How does using ten as a benchmark number help us add or subtract?

MATERIALS

- 99 chart per student
- Class 99 Chart
- Paper/math journals
- Transparent counters or highlighters

GROUPING

Large Group, Partners

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I
Gather students on the meeting area. Display class 99 chart. Give each student a 99 chart. Select a starting number. Have students place a transparent counter on it. Give students directions one at a time using the terms add 10, subtract 10, add 1, subtract 1, 10 more, 10 less, 1 more, and 1 less. After each clue, students move their transparent counter to the new number. Model this with the class, using only 3 or 4 directions. When the last direction has been given, ask students what number their transparent counter is on.

Sample direction set:

- Place your counter on 16.
- Add 10. (students should move their counter to 26)
- Subtract 1. (students should move their counter to 25)
- Move ahead 10 more. (students should move their counter to 35)
- What number is the counter covering? (35)

Repeat this activity several times as a class making sure to vary directions to include subtracting, moving back 1 or 10, 10 more, 10 less etc. Once students are comfortable with following the given directions, proceed to part II of the task.

Part II

Tell the students the game directions have now changed. Explain to the students that you need their help to create the directions to get to the number 45 from the number 14. Use the large class 99 chart to model the directions offered by students. Ask students to suggest directions. Possible scenario may include "Add 10 to 14." Now where are we? (24) "Add another group of ten." Where are we now? (34) Add 10 once more. (44) We are almost there, what should I add now? (1 more) "Where did we end?" (45)

Some students may have other possible directions. Encourage conversations about the difference in addition strategies presented. It is important to discuss how adding and subtracting 10 is more efficient. This also allows students to practice using 10 as a **benchmark number**, helping students to see that adding 12 is done faster by adding 10 and then 2 more. Working with groups of 10 in this task gives students more practice with understanding benchmarks of 10.

Continue with several classroom examples until students appear comfortable with creating directions. Include examples with numbers that have a larger starting point than ending point, so that subtraction is involved.

Allow students to work with a partner to create their own set of directions for a specific number. The teacher will provide the ending point, but will allow students to select their own starting point. For instance, 27 may be the end point the teacher designates. One set of partners may choose to start at 48 and another at 7; however, they will all end at 27. Allow time for several partners to share their different pathways to 27. Make comments about various ways to get to the number 27, encouraging students to use benchmark numbers to navigate the numbers.

Part III

Allow students to select any number they choose as their final destination. Then instruct the students to create 3 different paths to the same destination (same number). Students should include subtraction in at least one of the paths.

FORMATIVE ASSESSMENT QUESTIONS

- How can you give accurate directions that lead to your designated number?
- What addition/subtraction strategies did you use to give directions?
- How can skip counting help you create directions to your designated number?
- What benchmark numbers allow you to be more efficient when you add or subtract?

DIFFERENTIATION

Extension

- Play the "I Have, Who Has?" games. Examples and direction cards are available at http://math.about.com/od/mathlessonplans/ss/ihave.htm These games can be printed on cardstock and laminated for extended use.

Intervention

- Teacher can select numbers which would allow students to focus on using directions, "I am 1 or 10 less than_____, I am 1 or 10 more than____. What is the number?" This could be done with a sentence frame for students.

Name _____ Date_____

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