Strategic Number Counting Instruction

DESCRIPTION: The student is taught explicit number counting strategies for basic addition and subtraction. Those skills are then practiced with a tutor (adapted from Fuchs et al., 2009).

MATERIALS:

- Number-line (attached)

- Number combination (math fact) flash cards for basic addition and subtraction

- *Strategic Number Counting Instruction Score Sheet* (attached)

PREPARATION: The tutor trains the student to use these two counting strategies for addition and subtraction:

ADDITION: The student is given a copy of the appropriate number-line (1-10 or 1-20—see attached). When presented with a two-addend addition problem, the student is taught to start with the larger of the two addends and to 'count up' by the amount of the smaller addend to arrive at the answer to the problem.

SUBTRACTION: The student is given a copy of the appropriate number-line (1-10 or 1-20—see attached).. The student is taught to refer to the first number appearing in the subtraction problem (the minuend) as 'the number you start with' and to refer to the number appearing after the minus (subtrahend) as 'the minus number'. The student is directed to start at the minus number on the number-line and to count up to the starting number while keeping a running tally of numbers counted up on his or her fingers. The final tally of digits separating the minus number and starting number is the answer to the subtraction problem.

INTERVENTION STEPS: For each tutoring session, the tutor follows these steps:

1. *Create Flashcards.* The tutor creates addition and/or subtraction flashcards of problems that the student is to practice. Each flashcard displays the numerals and operation sign that make up the problem but leaves the answer blank.

2. *Review Count-Up Strategies*. At the opening of the session, the tutor asks the student to name the two methods for answering a math fact. The correct student response is 'Know it or count up.' The tutor next has the student describe how to count up an addition problem and how to count up a subtraction problem. Then the tutor gives the student two sample addition problems and two subtraction problems and directs the student to solve each, using the appropriate count-up strategy.

3. *Complete Flashcard Warm-Up*. The tutor reviews addition/subtraction flashcards with the student for three minutes. Before beginning, the tutor reminds the student that, when shown a flashcard, the student should try to 'pull the answer from your head'—but that if the student does not know the answer, he or she should use the appropriate count-up strategy to solve. The tutor then reviews the flashcards with the student. Whenever the student makes an error, the tutor directs the student to use the correct count-up strategy to solve. NOTE: If the student cycles through all cards in the stack before the three-minute period has elapsed, the tutor shuffles the cards and begins again.

   At the end of the three minutes, the tutor counts up the number of cards reviewed and records the number of

cards that the student (a) identified from memory, (b) solved using the count-up strategy, and (c) was not able to correctly answer. These totals are recorded on the Strategic *Number Counting Instruction Score Sheet*

4. *Repeat Flashcard Review*. The tutor shuffles the math-fact flashcards, encourages the student to try to beat his or her previous score, and again reviews the flashcards with the student for three minutes. As before, whenever the student makes an error, the tutor directs the student to use the appropriate count-up strategy. Also, if the student completes all cards in the stack with time remaining, the tutor shuffles the stack and continues presenting cards until the time is elapsed.

   At the end of the three minutes, the tutor again counts up the number of cards reviewed and records the number of cards that the student (a) identified from memory, (b) solved using the count-up strategy, and (c) was not able to correctly answer. These totals are again recorded on the Strategic *Number Counting Instruction Score Sheet.*

5. *Provide Performance Feedback*. The tutor gives the student feedback about whether (and by how much) the student's performance on the second flashcard trial exceeded the first. The tutor also provides praise if the student beat the previous score or encouragement if the student failed to beat the previous score.

Reference

Fuchs, L. S., Powell, S. R., Seethaler, P. M., Cirino, P. T., Fletcher, J. M., Fuchs, D., & Hamlett, C. L. (2009). The effects of strategic counting instruction, with and without deliberate practice, on number combination skill among students with mathematics difficulties. *Learning and Individual Differences 20*(2), 89-100.

Strategic Number Counting Instruction: Number-Lines

0   1   2   3   4   5   6   7   8   9   10

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
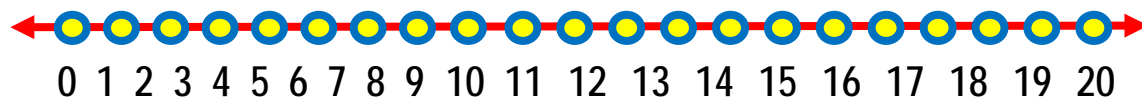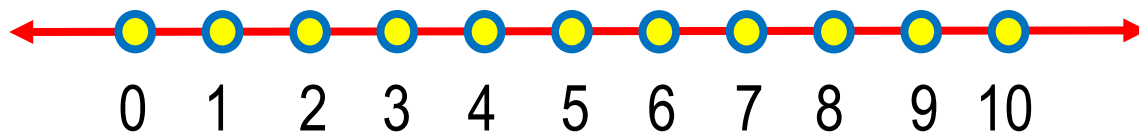
Strategic Number Counting Instruction Score Sheet

Student: _____   Interventionist(s): _____

Directions: During the strategic number counting instruction intervention, use this sheet to tally student responses: Number of Flash-Cards Known From Memory; Number of Flash-Cards Answered Correctly With Count-Up Strategy (with or without assistance); Number of Flash-Cards Unknown or Answered Incorrectly (even with assistance).

Date:_____	[Optional] Type/Range of Addition/Subtraction Math-Fact Flash-Cards Reviewed This Session:	
Trial 1: Math Flash-Card Warm-Up: 3 Minutes		
Number of Flash-Cards Known From Memory	Number of Flash-Cards Answered Correctly With Count-Up Strategy	Number of Flash-Cards Unknown or Answered Incorrectly
Trial 2: Math Flash-Card Review: 3 Minutes		
Number of Flash-Cards Known From Memory	Number of Flash-Cards Known From Memory	Number of Flash-Cards Known From Memory

Date:_____	[Optional] Type/Range of Addition/Subtraction Math-Fact Flash-Cards Reviewed This Session:	
Trial 1: Math Flash-Card Warm-Up: 3 Minutes		
Number of Flash-Cards Known From Memory	Number of Flash-Cards Answered Correctly With Count-Up Strategy	Number of Flash-Cards Unknown or Answered Incorrectly
Trial 2: Math Flash-Card Review: 3 Minutes		
Number of Flash-Cards Known From Memory	Number of Flash-Cards Known From Memory	Number of Flash-Cards Known From Memory