Self-Monitoring Strategies in Arithmetic

Frank, A.R., & Brown, D., (1992, Winter). Self-Monitoring strategies in Arithmetic. *Teaching Exceptional Children*, 52-53.

This math strategy is designed to help students who have been able to learn basic single-digit arithmetic facts but have difficulty in remembering how to solve problems that involve several steps. It helps them remember the steps involved in computing answers to arithmetic problems. It is designed to teach students to use a self-monitoring procedure that guides responding as arithmetic problems are completed. The strategy employs a mnemonic device to help students remember how to solve arithmetic problems once the self-monitoring procedure has been faded.

Procedure

- Provide students with a guide that prompts them to remember how to complete a task.
- Checklist:
    1. Carefully analyze the skill to be taught and identify the critical steps to be performed.
    2. Write down steps at a level that can be understood by the student(s).
    3. Organize the written statements in sequential order.
    4. Place the complete checklist next to each problem as it is done.
- Explain the checklist and give a concrete example of how to use the self-monitoring component. Once the student is able to use the procedure without assistance, the teacher can discuss a mnemonic strategy for remembering the steps in the checklist.
- Once the student is showing success with the checklist they should be encouraged try and use the mnemonic device and wean them off of the checklist. First remove the steps from the top of the worksheet and later omit the checklist adjacent to individual problems.
- When transitions are difficult the checklist can either be placed on note cards or a chart on the wall.

A Subtraction Illustration

- 4 critical steps to solving multi-digit subtraction problems
    1. Starting in the 1st column
    2. Determine which numeral in each column is bigger
    3. Regrouping if the bottom numeral is bigger
    4. Check basic facts

    The mnemonic strategy "4Bs" helps students remember the 4 steps: *Begin, Bigger, Borrow, and Basic Facts*.
- The student begins the first problem by looking at the first step at the list of directions. Starting with *Begin* – the student then places a check mark on the line by *Begin.*
- Next, the student refers to the second step at the top of the page, which prompts them to determine which numeral in the 1st column is bigger. The student places a check mark on the line next to the word *Bigger* above the first column, and continues to do so for the 10's and 100's columns, completing each step and checking it off in sequential order.

**Subtraction Worksheet Including a
Self-Monitoring Strategy**

Name _____ Date _____

SUBTRACT. Remember the 4 B's:
Begin? In the 1s column.
Bigger? Which number is bigger?
Borrow? If bottom number is bigger I must borrow.
Basic Facts? Remember them. Use Touch Math if needed.

- Begin	- Begin	- Begin
- - - Bigger	- - - Bigger	- - - Bigger
- - - Borrow	- - - Borrow	- - - Borrow
- - - Basic Facts	- - - Basic Facts	- - - Basic Facts
8 7 6	6 2 3	5 6
- 3 9 8	- 1 5	- 3 5

Modifications for Use with Addition Problems

- 4 critical steps to solving multi-digit addition problems:
    1. Start in the 1s column
    2. Add together the numerals in each column
    3. Determine whether or not regrouping is necessary
    4. Check to see whether or not the correct numeral has been carried to the next column when regrouping is necessary.
- The word *SASH* can be used as a mnemonic strategy to help students remember the steps: (*S*tart in the 1s column; *A*dd the numerals together; *S*hould I carry a numeral? and *H*ave I carried the correct numeral?)

Addition Worksheet Including a
Self-Monitoring Strategy

Name _____ Date _____

ADD. Remember SASH
Start In the 1s column.
Add together the numerals in each column.
Should I carry a numeral?
Have I carried the correct numeral?

- Start	- Start	- Start
- - - Add	- - - Add	- - - Add
- - - Should I carry	- - - Should I carry	- - - Should I carry
- - - Have I carried	- - - Have I carried	- - - Have I carried
1 2 7	3 5 7	6 4
+ 3 9 8	+ 1 2	+ 1 7

Modifications for Use with Multiplication Problems

- There are also 4 critical steps in solving multi-digit multiplication problems.
  1. Multiply the 1s column.
  2. Carry any 10s over to the 10s column.
  3. Multiply the bottom 1s digit with the top 10s digit.
  4. Add any number that was carried in step 2 to the product of step 3.
- The word *MAMA* can be used as a mnemonic strategy to help students remember the steps: (*Multiply* the 1s column; *Across* to the 10s; *Multiply* the bottom 1s digit with the top 10s digit; *Add* any number that was carried in step 2)

Multiplication Worksheet Including a
Self-Monitoring Strategy

Name _____   Date _____

MULTIPLY. Remember *MAMA*
Multiply the 1s column.
Across to the 10s.
Multiply the bottom 1s digit with the top 10s digit
Add any number that was carried in step 2

- Multiply	- Multiply	- Multiply
- - Across	- - Across	- - Across
- - Multiply	- - Multiply	- - Multiply
- - Add	- - Add	- - Add
1 7	3 5	6 4
x 8	x 3	+ 7