

Math Computation: Increase Accuracy and Productivity Rates Via Self-Monitoring and Performance Feedback



Students can improve both their accuracy and fluency on math computation worksheets by independently self-monitoring their computation speed, charting their daily progress, and earning rewards for improved performance.

Materials

- Collection of student math computation worksheets & matching answer keys (NOTE: Educators can use a free online application to create math computation worksheets and answer keys at <http://www.interventioncentral.org/htmldocs/tools/mathprobe/addsing.php>)
- Student self-monitoring chart

Steps to Implementing This Intervention

In preparation for this intervention:

- the teacher selects one or more computation problem types that the student needs to practice. Using that set of problem types as a guide, the teacher creates a number of standardized worksheets with similar items to be used across multiple instructional days. (A Math Worksheet Generator that will create these worksheets automatically can be accessed at <http://www.interventioncentral.org>).
- the teacher prepares a progress-monitoring chart. The vertical axis of the chart extends from 0 to 100 and is labeled 'Correct Digits' The horizontal axis of the chart is labeled 'Date'.
- the teacher creates a menu of rewards that the student can choose from on a given day if the student was able to exceed his or her previously posted computation fluency score.

At the start of the intervention, the teacher meets with the student. The teacher shows the student a sample math computation worksheet and answer key. The teacher tells the student that the student will have the opportunity to complete similar math worksheets as time drills and chart the results. The student is told that he or she will win a reward on any day when the student's number of correctly computed digits on the worksheet exceeds that of the previous day.

During each day of the intervention:

1. The student is given one of the math computation worksheets previously created by the teacher, along with an answer key. The student first consults his or her progress-monitoring chart and notes the most recent charted computation fluency score previously posted. The student is encouraged to try to exceed that score.

2. When the intervention session starts, the student is given a pre-selected amount of time (e.g., 5 minutes) to complete as many problems on the computation worksheet as possible. The student sets a timer for the allocated time and works on the computation sheet until the timer rings.
3. The student then uses the answer key to check his or her work, giving credit for each correct digit in an answer. (A 'correct digits' is defined as a digit of the correct value that appears in the correct place-value location in an answer. In this scoring method, students can get partial credit even if some of the digits in an answer are correct and some are incorrect.).
4. The student plots his or her computational fluency score on the progress-monitoring chart and writes the current date at the bottom of the chart below the plotted data point. The student is allowed to select a choice from the reward menu if he or she exceeds his or her most recent, previously posted fluency score.

References

Bennett, K., & Cavanaugh, R. A. (1998). Effects of immediate self-correction, delayed self-correction, and no correction on the acquisition and maintenance of multiplication facts by a fourth-grade student with learning disabilities. *Journal of Applied Behavior Analysis, 31*, 303-306.

Shimabukuro, S. M., Prater, M. A., Jenkins, A., & Edelen-Smith, P. (1999). The effects of self-monitoring of academic performance on students with learning disabilities and ADD/ADHD. *Education and Treatment of Children, 22*, 397-414.

Self-Monitoring Progress Monitoring

The next page is an easy way to record & graph your math computation progress monitoring data. Here are the steps to use them:

- 1. Collect 3 samples of the student's correct digits per 2 minutes on a Math CBM probe. Circle these three numbers in the gray "baseline" section (one per column).**
- 2. Begin intervention.**
- 3. One time weekly, collect a sample of the student's correct digits per 2 minutes on a Math CBM probe and circle that number in the white "intervention" section.**

Tips:

Date each data point in the first row of the table.

You may find Math probes and directions on www.interventioncentral.org under the CBM Warehouse.

Progress Monitoring: Frequency

Student Name: _____
 Data Collected by: _____

Grade Level: _____
 School Year: _____

Area Targeted: _____

Goal: _____

Date													
	25	25	25	25	25	25	25	25	25	25	25	25	25
	24	24	24	24	24	24	24	24	24	24	24	24	24
	23	23	23	23	23	23	23	23	23	23	23	23	23
	22	22	22	22	22	22	22	22	22	22	22	22	22
	21	21	21	21	21	21	21	21	21	21	21	21	21
	20	20	20	20	20	20	20	20	20	20	20	20	20
	19	19	19	19	19	19	19	19	19	19	19	19	19
	18	18	18	18	18	18	18	18	18	18	18	18	18
	17	17	17	17	17	17	17	17	17	17	17	17	17
	16	16	16	16	16	16	16	16	16	16	16	16	16
	15	15	15	15	15	15	15	15	15	15	15	15	15
	14	14	14	14	14	14	14	14	14	14	14	14	14
	13	13	13	13	13	13	13	13	13	13	13	13	13
	12	12	12	12	12	12	12	12	12	12	12	12	12
	11	11	11	11	11	11	11	11	11	11	11	11	11
	10	10	10	10	10	10	10	10	10	10	10	10	10
	9	9	9	9	9	9	9	9	9	9	9	9	9
	8	8	8	8	8	8	8	8	8	8	8	8	8
	7	7	7	7	7	7	7	7	7	7	7	7	7
	6	6	6	6	6	6	6	6	6	6	6	6	6
	5	5	5	5	5	5	5	5	5	5	5	5	5
	4	4	4	4	4	4	4	4	4	4	4	4	4
	3	3	3	3	3	3	3	3	3	3	3	3	3
	2	2	2	2	2	2	2	2	2	2	2	2	2
	1	1	1	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	0	0	0	0	0	0	0	0	0
	Baseline			Intervention									

FREQUENCY