

Calculated Improvement

This school found a way to dramatically improve its students' math ability.

By Lynn Hatfield

In response to our students' marked weakness in computation, including their widespread reliance on counting on fingers to do simple calculations even in the junior division, along with unsatisfactory performance on county-wide standardized tests, my school undertook an initiative designed to improve speed and accuracy. The **Math Accuracy and Time Help** skill drills program (**MATH**) was introduced after it had been found effective by the Council for Exceptional Children in their programs.

The MATH program involves multiple copies of each drill for each level, bound in six different books, designed so that most students should be able to complete the entire program by the end of grade 6. Each student progresses at his own rate. When a pupil meets the time and accuracy criteria for each sheet, he moves on to the next level until he completes the book.

Mastery of speed and accuracy at each level is verified by the teacher's signature. Students graph their daily performance on individual progress charts. When a pupil completes a book, he comes to the office where the principal reviews the work, checks the marking and the progress chart, and issues the next book.

Book 1 includes a number of timed drills at increasing levels of difficulty covering basic addition and subtraction.

Book 2 covers more advanced addition and subtraction, as well as basic multiplication.

Book 3 consists of more challenging multiplication and basic division.

Book 4 involves advanced division, estimation, basic fractions and decimals.

Book 5 addresses intermediate and advanced fractions.

Book 6 includes a review of decimals and fractions, and covers percent, imperial and metric, geometric concepts, and other grade 6 material.

Initially, some of the grade 1 and grade 2 teachers were somewhat reluctant to participate, citing the work as "too difficult for their students," having concerns about "creating a stressful situation for some pupils," and "questions that went beyond local requirements." Generally, they were not excited about "doing drills" nor did they think their students would be.

When the teachers were asked to estimate the level at which their students would be successful, every teacher but one in grade 6 selected Book 1 to begin! That teacher selected Book 2 and subsequently had to take her class back to Book 1.

At the end of each month, the teachers posted the names of their **skill drill leaders** and **most improved students**. All the names were displayed at the main entrance to the school, indicating the level they had successfully completed and if they were first-time or repeat leaders. Their names were also published in the school newsletter and submitted to the local newspaper. The students were recognized at the monthly school assembly by applause from their peers and a small gift of a school pen.

The students' progress was tracked using the Canadian Achievement Tests. Monitoring the scores of students entering grade 4 before the program was introduced and then coming into grade 4 for the next two years, we see the improved learning outcomes that were achieved.

Scores on C.A.T.

	Grade 4.1	Grade 4.1	Grade 4.1
Math Concepts	3.7	4.3	5.0
Computation	3.6	3.7	4.3
Overall	3.6	3.8	4.5

The "Math Concepts" category includes such things as data interpretation, logical reasoning and pre-algebra.

A less objective, but no less important measure of the success of the program was the excitement, enthusiasm and pride in achievement observed in the children. More than a year after I left the school, a little girl came running up to me at the local arena. The first thing she said to me was: "Mrs. Hatfield! Mrs. Hatfield! Guess what? I'm on Level 33! I finished four levels this month!"

Here is what the students had to say.

"It's fun. We get to mark them. It's nice to know when you pass a level." Jennifer, Grade 6

"I'm on Level 6. I'm fast at adding." David, Grade 2

"Actually a very challenging contest in which you are the only contestant and you can set your own goals." Jordan, Grade 6

"Skill Drills are fun to do. You feel happy when you pass through the levels." Natalie, Grade 5

It is interesting to note that the use of the MATH program for just 10 minutes a day resulted in an improvement not only in basic skills but also increased achievement in all areas tested. It is my view that this is somewhat like the reading process. When a student is freed up from the laborious task of decoding most of the words in a passage, his comprehension improves. So in math: when basic computation can be done with speed and accuracy, more attention can be given to the process or problem.

One of the unexpected results of the MATH program was the extent of the generalization that was evident in gains in math concepts and applications, including logical reasoning.

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