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Math program's benefits add up

New teaching style successful at Kuumba Academy



Teacher Colleen Sheeron looks for enough people to have an answer and snaps her fingers before asking one of the students to state the answer. The Kuumba Academy Charter School third-grade teacher uses Singapore Math techniques.
The News Journal/ROBERT CRAIG

Written by [NICHOLE DOBO](#)

WILMINGTON -- Several years ago, when teacher Colleen Sheeron was first presented with Kuumba Academy Charter School's new math curriculum, she was nervous.

She was a "terrible" math student when she was in school. And now, as an elementary school teacher, Kuumba wanted her to learn a new way to teach the subject. It wasn't enough to memorize tricks to teach division. She had to understand that division is grouping numbers: nine is three grouped three times; therefore, nine divided by three is three. And then she had to teach her students that deeper understanding.

"It was an eye-opener for me," Sheeron said.

Today, Sheeron loves teaching math. She's the school's math coach. She helps novice teachers learn how to teach using Singapore Math, a program adopted several years ago by the charter school with assistance from the Delaware Foundation for Science and Mathematics Education, a Wilmington nonprofit.

“Teachers that started using the program are teaching a concept to mastery rather than teaching a concept then moving on,” said Sally Maldonado, head of school at Kuumba Academy Charter.

The school saw an incredible jump in math scores soon after implementing the program, and those scores have stayed high. This year, the school reached another goal. The students are scoring on par with the average with all students in Delaware – an achievement for Kuumba, which primarily serves poor and minority students. Nationally and statewide, these at-risk students tend to score lower than the average on academic achievement tests, a phenomenon known as the “achievement gap.”

There’s been no study that shows the math program has solely helped the school close the achievement gap in math, but leaders there believe that the Singapore Math program was crucial to the school’s success. The program, which is a translation of a successful math program from Singapore, stresses traditional concept learning and the textbooks don’t require advanced literary skills, said Anne M. Pfaelzer de Ortiz, operations manager at the Delaware Foundation for Science and Mathematics Education.

“The students are better able to focus on the math concepts,” Pfaelzer de Ortiz said. “The whole core of the curriculum is problem-solving.”

School leaders at Kuumba say the new math program was key in helping children increase their math scores, but they know it was not a silver bullet. There have been systematic changes at the school that include parental involvement programs, wrap-around support and continued attention to be sure teachers are properly trained.

That training in Singapore math has not been cheap or easy, two barriers for some schools. The charter school received money from private businesses to help pay for it, and Wilmington University donated the building space for teachers to develop the skills. Now Kuumba teachers and the Delaware Foundation for Science and Mathematics Education are helping the Brandywine School District push forward with implementing the Singapore Math program. Brandywine is the only full district in Delaware to adopt the curriculum, said Alexis Andrianopoulos, a spokeswoman for Brandywine.

Sheeron, the school math coach, helped train Brandywine teachers.

“We want to share our techniques,” Sheeron said.

On a recent day, Sheeron held an iPhone and walked around kindergarten teacher John Vitsorek’s room making a video as he taught math class. She was taping Vitsorek because he’s a veteran teacher – new teachers will learn from him by watching his techniques.

Students followed along as Vitsorek (known by students as Mr. V) led them through several math exercises. He held up cards and asked students to count the dots. Soon,

students returned to their desks, where they flipped over a piece of paper and began working on a “sprint,” a timed 60-second math drill. They were to count the dots and then circle the correct corresponding number.

That drill was repeated all around Kuumba, as were several other components of the math program. The consistency to the approach, and the devotion to complete learning of a subject before moving on to another, are two hallmarks of math at Kuumba, a school that opened in 2001 and serves about 250 students in kindergarten through fifth grade.

As Vitsorek timed a math drill for his kindergarten students, he walked around the room to observe student work. He offered encouragement to those who seemed to be struggling. He stopped by the chair of one student. Count them, he told her, pointing to each item on the paper. The girl caught on, and she eventually completed the task with time to spare. She smiled when the teacher praised her.

“Good job, good job,” he said. “Now write your numbers on the back and think about how you did it.”

That’s a moment that educators at Kuumba and the Delaware Foundation for Science and Mathematics Education are seeking.

“It is fun because they know it,” said F.M. Ross Armbrecht Jr., executive director of the Delaware Foundation for Science and Mathematics Education. “They feel good about it.”

ARE YOU SMARTER THAN A KUUMBA ACADEMY THIRD-GRADE STUDENT?

Take a test. Here's one of the math "sprints" done by Colleen Sheeron's third-grade students on a recent week. Each sprint contains 30 questions. Do as many as possible in 60 seconds. Be sure someone watches the clock while you work -- the teacher times the math sprints with a stopwatch.

- 1.) 0, 4, ____, 12
- 2.) 0, ____, 8, 12
- 3.) 4, 8, 12, ____
- 4.) 0, 4, 8, ____
- 5.) 8, 12, ____, 20
- 6.) ____, 12, 16, 20
- 7.) ____, 8, 12, 16
- 8.) 8, ____, 16, 20
- 9.) 12, ____, 20, 24

10.) 16, ____, 24, 28

11.) 20, 24, ____, 32

12.) 24, ____, 32, 36

13.) 16, 20, 24, ____

14.) 24, ____, 32, 36

15.) ____, 32, 36, 40

16.) 32, ____, 40, 44

17.) 36, 40, ____, 48

18.) 48, ____, 40, 36

19.) 44, ____, 36, 32

20.) 48, 44, 40, ____

21.) 40, ____, 32, 28

22.) 36, ____, 28, 24

23.) 44, 40, 36, ____

24.) 28, ____, 20, 16

25.) 20, 16, ____, 8

26.) 24, ____, 16, 12

27.) 36, ____, 28, 24

28.) 48, ____, ____, 36, 32

29.) 16, 12, ____, ____, 0

30.) 24, ____, 16, ____, 8

Answer key: 1.) 8, 2.) 4, 3.) 16, 4.) 12, 5.) 16, 6.) 8, 7.) 4, 8.) 12, 9.) 16, 10.) 20, 11.) 28, 12.) 28, 13.) 28, 14.) 28, 15.) 28, 16.) 36, 17.) 44, 18.) 44, 19.) 40, 20.) 36, 21.) 36, 22.) 32, 23.) 32, 24.) 24, 25.) 12, 26.) 20, 27.) 32, 28.) 44, 40; 29.) 8, 4, 30.) 20, 12

What are students learning in this drill? Here's an expert explanation from F.M. Ross Armbrecht Jr., executive director of the Delaware Foundation for Science and Mathematics Education.

“This sort of question is important at a number of different levels. One is that being able to recognize a pattern is an important math skill. Second is that multiplication is taught as multiple, orderly addition of the same number. This then leads to a reason for memorizing, for example, that three fours may be quickly added, but eight fours takes a lot longer, and so it’s quicker to memorize some small number of these so that they can be quickly employed to do large multiples of four or any number. Third, this sprint is supposed to be fun and a challenge, so if you recognize these are patterns of fours with a missing step, you can do these faster by adding a four or subtracting a four to fill in the blank or say, “I see a 1×4 and a 3×4 so the middle must be a 2×4 . And the kids want to see how many they can get right. Memorizing then becomes the way to solve this ‘game’ quickly.”



Kuumba Academy Charter School third-grade teacher Colleen Sheeron looks for enough people to have an answer before asking one of the students to respond. Sheeron uses Singapore Math techniques. / THE NEWS JOURNAL/ROBERT CRAIG



Khadijah Fore shows she has an answer to the teacher's question. The News Journal/Robert Craig



(From right) Ariel Johnson, JayWan Howard and JaWon's mom Jawanda Howard. The News Journal/Robert Craig



Christian Taylor thinks he has the answer. Parents, shown in the background, are invited into the school to work with the children on the math lessons and challenges. The News Journal/Robert Craig



Kumba closes achievement gap in math: Kuumba Academy Charter School uses a type of math program called 'Singapore Math.' The News Journal/Robert Craig