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Singapore Math Demystified!

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The Daily Riff EXCLUSIVE series

UPDATE: See Bill Jackson's new guest post tomorrow: October 6th

UPDATE October 1.2010: Bill Jackson featured in NYT [HERE](#).

Singapore Math: Can It Help Solve Our Country's Math-phobia?

Editor's Note: Due to the interest expressed over our previous posts about Singapore Math and the non-Singaporean-specific classic, "Why Our Kids Don't Get Math" [here](#). The Daily Riff is featuring an exclusive original four-part series by Bill Jackson, Math Helping Teacher, Scarsdale, NY Public Schools, one of the highest performing districts in the country.

We asked Bill to share his truly incredible (which is both humbling and exhilarating) global journey into math education from Singapore to Japan and back again to the United States in an original series for The Daily Riff. His posts are becoming classics in the Singapore Math lexicon. - C.J. Westerberg

How I Became Interested In Singapore Math Part 1

By Bill Jackson

In 1997, I attended a series of workshops on the Third International Mathematics and Science Study (TIMSS). That study compared math achievement in over 40 countries in grades 4, 8 and 12. Singapore and a handful of East Asian countries performed extremely well, much better than the United States, which had a mediocre performance. I was an 8th grade teacher at Public School No. 2 in Paterson, New Jersey at the time.

At the workshop we watched videotapes of mathematics classrooms from Japan, Germany and the U.S. The U.S. lesson looked very familiar. The teacher showed his students how to do a procedure and then they practiced while the teacher helped individual students. The Japanese lesson looked very different, however. The teacher began the lesson by posing a rich problem. Then the students solved the problem based on what they had learned previously and shared different solution methods. Important mathematical points of the lesson were brought out through class discussion of the various methods. The students looked very engaged and they even clapped for each other. After watching the video, I felt that my students were getting shortchanged and I became determined to learn how to teach like that Japanese teacher!

Making this change, however, would not be easy. The lessons in the heavy 600+ page textbook we were using did not begin with problem solving. In fact, the **word problems were the last thing on the page and often times we were so busy practicing procedures that we didn't even get to them. I decided to teach my lessons backwards** by posing one of the word problems at the bottom of the page and then asking the students to solve it, share and discuss their methods. I explained to my students what I was trying to accomplish and even showed them the TIMSS videotapes. I was amazed at how quickly they adjusted to the new methodology and how engaged they were. **They were actually starting to like math.** They even began to clap for each other after they presented their solutions!

I soon realized, however, that there was much more to good math teaching than merely imitating the steps of the Japanese lesson. I got involved in a math study group begun by our principal to study the TIMSS data, read books and articles, and explore how to improve mathematics instruction. This led in 1999 to a partnership with [researchers](#) from Teachers College and a [Japanese school](#) in Greenwich, CT to conduct [lesson study](#), a process where groups of teachers plan, observe and discuss actual classroom lessons. I also traveled to Japan to observe mathematics classes and learn about the Japanese school system.

When I began working with the Japanese teachers, I soon realized three important reasons why they were such good math teachers:

(1) They had a high level of math content knowledge. In fact, I felt that their first grade teachers knew more about math than I did as an 8th grade teacher!

(2) They used thin, lightweight paperback textbooks that were much more focused and coherent than our heavy hard cover books.

(3) They continually worked to improve their teaching throughout their careers by conducting lesson study.

We began conducting lesson study at our school but we found that it was difficult to develop engaging and focused lessons like the Japanese teachers taught because of our unfocused textbooks. This led us to the [Primary Mathematics](#) textbooks from Singapore. Like the Japanese textbooks they were thin and lightweight and **addressed fewer topics per year with depth and coherence.** They were also very kid friendly with simple cartoon drawings that highlighted important mathematical ideas. **One of the things we liked the most about them was a very effective method to solve complex problems using pictorial diagrams called bar models.**

In 2000, we decided to adopt Singapore's Primary Mathematics (Third Edition) textbooks in grades K-8. The books used British spellings and had strange foods like durians and rambutans, but these things did not impede students' understanding of the mathematics. Later we switched to the [Primary Mathematics U.S. Edition](#), which used American English and included customary measures. For kindergarten we used [Earlybird Kindergarten Mathematics](#) and in grades 7 and 8 we used [New Elementary Mathematics](#).

With the adoption of Singapore math textbooks combined with lesson study, math teaching began to improve at our school. But there were also challenges. We realized that in order to teach Singapore Math successfully we needed to improve our mathematical content knowledge so we invited knowledgeable others to conduct workshops for teachers. We also realized that our math content knowledge was improving just by teaching lessons from the textbooks and later found out that the textbooks were designed so teachers could acquire this knowledge since Singaporean elementary teachers are generally not math specialists. I also came out of the classroom to become the school's math facilitator. In small group meetings, we conducted lesson study, studied the textbooks, and solved problems together using bar models.

I'll never forget the time we were solving a difficult 6th grade problem with first grade teachers and one teacher jumped up and shouted excitedly, "I got it!" She was so excited that she was finally getting it after not having a good mathematics learning experience herself as a child. The lesson study process was instrumental in allowing us to study the materials together and discuss how to craft good lessons.

In 2008, I left the Paterson school district and was hired by [Scarsdale Public Schools](#) as one of three district wide Math Helping Teachers to help facilitate the adoption of Singapore Math. Scarsdale is using the [Primary Mathematics Standards Edition](#) textbooks. **It is interesting to me that Scarsdale, one of highest performing and most innovative school districts in the country, has adopted Singapore Math.** Before making the decision, they spent time researching and piloting the program. They concluded that even though their students were doing well already in comparison to most students nationwide, **they needed to continually improve mathematics instruction.** This was a very wise decision in my opinion and the implementation has been very successful. Teachers, students and parents are enthusiastic about the program and many groups of teachers have also conducted lesson study. One Scarsdale fifth grade teacher said, "Primary Mathematics has given me the opportunity to love teaching math. In turn, my students love math and impress me everyday as they become incredible mathematicians."

That's all for now. In future posts I will discuss Singapore Math in more detail, including the philosophy of the program, problem solving methods, and tips for successful implementation.

Bill Jackson
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Part 2: [Can Solving Problems Unravel Our Fear Of Math?](#)

The Singapore Math Program philosophy - Problem-based, concrete-pictorial- abstract approach

Part 3: [Singapore Math: Is this the most Visual Math? The Signature Bar Modeling Method](#)

Part 4: [How To Bring Singapore Math to Your School](#)

Check out Bill Jackson's recent Travel Journal To Singapore - Five part series

Part 1: [Singapore: Five Surprises in Education](#)

Also:

["Travel Journal - Japan" Teacher Professional Development. Learning & Teaching Techniques](#)

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