

Adam de Pencier: Excellence in Canadian math education — by way of Singapore



ADAM DE PENCIER, NATIONAL POST | September 5, 2014 6:58 AM ET
[More from National Post](#)



Students in Singapore in the middle school years rank consistently in the top worldwide for math and science testing. AP Photo/Kyodo News
So why not look to that country for tips on how to educate our own students?

Like | Share 7 | [Twitter](#) | [Google+](#) | [LinkedIn](#) | [Email](#) | [Comments](#) | [More](#)

What is the best way to teach math and science?

It's a question that Canadian educators and parents have been asking a lot in recent years, prompted by domestic and international tests that indicate a decline in the math and science test scores of Canadian students. Just this week, Ontario's Education Quality and Accountability Office (EQAO) results showed that more than half of the high school students in Grade 9 applied math are not meeting the provincial standard.

Math education is a subject of lively debate in this country: Should we stick with the “new math,” or return to the old “drill-and-kill” method?

As Head of school at Trafalgar Castle School, an independent day and boarding school for girls’ grades 5-12 in Whitby, Ont., I have asked these questions myself. But instead of wrestling with the “new math vs. old math” argument, we at Trafalgar Castle chose another option: Singapore Math.

We introduced Singapore Math to our school three years ago after researching a number of programs and determining that this method had the best achievement results internationally. We are constantly evaluating programs from countries around the world that have proven to be successful. Students in Singapore in the middle school years rank consistently in the top worldwide for math and science testing, way beyond most other countries (including Canada).

Related

[Math wars: Rote memorization plays crucial role in teaching students how to solve complex calculations, study says](#)

[Robyn Urback: Math isn’t hard. Teaching it is](#)

Students in Grade 5 through 8 learn math through this innovative teaching method. Singapore Math deliberately slows down the teaching of math, taking more time to ensure students grasp each concept before moving on. For example, students might spend two weeks on multiplying fractions, instead of spending a day or two and then coming back to it later.

Students use visual aids such as bars and blocks before they start writing equations with “x” and “y,” so they achieve a deeper grasp of the actions they perform. This visualization is not deployed nearly as much in Canadian classrooms. In most settings, you would see a concrete-abstract strategy whereby multiplication would use physical objects then shift to the abstraction of lining up numbers in a multiplication equation. Singapore Math introduces a middle step between the concrete and abstract called the pictorial approach. The students draw a diagram of the concepts going on. This extends to diagramming word problems on paper rather than the often frustrating scenario of trying to picture a problem in their heads.

There is a dearth of qualified people to teach the subject, especially at the elementary level

One happy result of all this is that when students reach algebra, they've already met the core concepts pictorially; indeed in most cases students in grade 6 are able to understand algebraic concepts that normally wouldn't be grasped until mid-way through grade 8.

Another important element of Singapore Math is that it relies on strong mathematics teaching. You need people who know and love mathematics to teach it. This is not as simple as it sounds, as there is a dearth of qualified people to teach the subject, especially at the elementary level.

When it comes to student performance, the response to Singapore Math has been overwhelmingly positive. Each year, the Singapore Math students have performed above grade level, and their overall final averages continue to rise each year. Perhaps even more importantly, our students love math. In fact, we were so pleased with the results that we added Singapore Science to the curriculum last year.

Like its math counterpart, Singapore Science is an interactive and "hands-on" method of teaching, devised to stimulate students' natural curiosity and cultivate their spirit of inquiry. In Singapore Science, students do experiments to learn key concepts, incorporating active discussion and real-world examples. We've put a lot of resources into our labs so that the children can learn by doing. The core of the program is teaching the experimental method.

The Singapore Method might not work for everyone, but it certainly has for us. Kids have an amazing capacity to learn, and in our view, you have to look beyond our borders to find the best teaching methods possible.

National Post

Adam de Pencier is Head of School at Trafalgar Castle School in Whitby, Ontario.