From Newsweek

Calculating a New Approach

Mar 13, 2008 8:00 PM EDT

A report on math education fuels the debate about the Singapore model. What is it--and would it work here?

This week, after two years of deliberation, the National Mathematics Advisory Panel released their report aimed at improving math education in this country. And you could almost hear the sound of textbooks--that heavy one in your kid's backpack, and a stack of high-stakes math tests, the kind your kid take every year--landing in the garbage can with a thud.

The advisory panel, made up of 24 educators and mathematicians, is all for textbooks and testing. In fact, the report specifically endorses regular math assessment. But after months of hearings, the panel was unequivocal that we need to change the way math is being taught--and the way we test it. Right now, it's simply too broad, too unfocused, repetitious and, in the end, treated too superficially. Instead, the report recommends, "the mathematics curriculum in Grades PreK-8 should be streamlined and should emphasize a well-defined set of the most critical topics in the grades." Teachers should focus on skills like computing with whole numbers, fractions, geometry and measurement. Most importantly, those skills should be taught in a coherent sequence so that by late middle school, more students have a proper foundation from which to unravel the elegant puzzles of algebra. "Students who complete Algebra II are twice as likely to graduate from college compared to students with less mathematical preparation," the report says.

Which means that a lot of states are going to have to start scrambling. In most places, math standards, which are determined by the state and sometimes the district, are a hodgepodge of as many as a hundred different topics related to math: word problems, computation exercises, probability games. And teachers are required to cover them all in a single year. Textbooks, which are written to follow state standards, are also overlong and often incoherent. Take that math book out of your kid's backpack and look at it. It's likely to be a massive tome that includes chapter after chapter with photographs, puzzles, data charts, "Did You Know" factoids and even a few games. And the yearly assessments are often just as incoherent.

Instead, states need to figure out what's crucial, when to teach it, and make sure teachers follow the formula. "The conversation needs to be, at every grade level, 'What's important here?' " says Francis Skip Fennell, president of the National Council of Teachers of Math, which came up with their own pared-down guidelines for math instruction in 2006, which strongly influenced the math panel's recommendations.

The findings of the panel come when international assessments show U.S. students rapidly falling behind other developing countries. A 2007 assessment found that 15-year-olds in the U.S. ranked 25th out of 30 developed nations in computation, problem solving and math literacy. The panel was convened in 2006 by President Bush to address concerns about the lack of homegrown mathematicians, engineers and scientists.

The panel's report tries to defuse factional tension between proponents of new math, fuzzy math, back-to-basics math and the like. The report says teacher-directed approaches (the skills-and-drills method) or student-centered approaches (based on individual or group exploration of math concepts) each have a place.

At the same time, the report will provide momentum to the small but increasingly influential group of math researchers and educators who see the curriculum used in Singapore, often called Singapore Math, as the gold standard. Singapore math is very lean, says Charles Patton, a software developer at SRI International and math-education researcher who is working with Singapore's National Institute of Education. The Singapore curriculum flows coherently from one subject to another, culminating in algebra. "If you flip through the pages of an American math textbook and a Singapore math textbook, you begin to understand just how much thought and effort went into sequencing and wording. It is a very powerful and well-engineered tool," he says.

Since 2006, when the NCTM published its guidelines, several states have begun looking at ways to simplify their math curriculum. But Patton cautions against schools simply grafting Singapore Math textbooks onto their already existing math program. Singapore's teachers are trained by a single institution, which also provides the math curriculum, tests and textbooks. Teachers get about 100 hours of professional development to work on their instructional skills. "If you simply drop a Singapore math textbook into your math program," says Patton, "it is bound to fail."