Schools take stock of new math program

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Scarborough students in kindergarten to fifth grade can look forward to a new and engaging way to learn mathematics this year.

The Scarborough School Department now uses Math in Focus: The Singapore Approach. The new curriculum provides students with a balanced, research-based curriculum that emphasizes mastery and understanding of mathematical skills to develop critical and creative thinking, said Monique Culbertson, the department's director of curriculum and assessment.

Culbertson said the program is an opportunity for students to develop mathematical skills that will lead them to greater success in life.

"We're very excited about the potential here," she said. "The national consultant who came in to work with teachers was impressed with the enthusiasm of math instruction and left feeling quite confident, saying we may be a demonstration site in the future. That kind of feedback is exciting and the credit goes to teachers for their energy and time preparing for a new curriculum."

The new program, which has been in research and development for two years, places greater emphasis on "mastery" of mathematical skill sets before students move on to more challenging lessons said Culbertson.

"The content is not one of a spiraling curriculum where students keep repeating the same thing year after year," Culbertson said. "The content is one where students' focus in on a specific area to develop skill and proficiency. They are going to be getting more in-depth on topics because they will be working toward mastery of a skill."

Like the previous math curriculum, Culbertson said skills will continually be reinforced and built upon, although the new program allows for a greater understanding of different skill sets such as multiplication, division, addition and subtraction. Teaching will involve class-led discussions, as well as independent study for individual students who are working on mastery of certain skill sets.

The framework of the curriculum centers around five core principles aimed at achieving mathematical problem solving: attitudes, meta-cognition, processes, concepts and skills.

The attitudes component deals with appreciation, interest, confidence and perseverance of mathematical topics. The meta-cognition component deals with monitoring ones own thinking.

The processes component deals with thinking skills and strategies. The concepts component deals with numerical, geometrical, algebraic and statistical concepts. The skills component deals with estimation approximate mental calculation, communication and use of mathematical tools, algebraic manipulation and data analysis, according to Culbertson.

The curriculum follows what is known as a concrete-pictorial-abstract progression, meaning that students will understand both how math works and why it does, Culbertson said.

Concrete concepts include physical items that aid in the assistance of learning math, such as building blocks, cubes, tiles, chips and other items. The pictorial component includes pictures, bar graphs and models, number bonds, diagrams, charts and other diagrams.

The abstract component deals with concepts such as numerals, mathematical notation and symbols, algorithms, estimation, predications and written and oral explanations.

Students also will use textbooks and technology resources to assist them in understanding concepts taught throughout the curriculum.

For Kathy Tirrell, math specialist at Scarborough Middle School, the program is eagerly anticipated.

“We’re really excited,” Tirrell said. “One of things that strikes me about it being a good fit is that it has problem solving embedded in the program, so students will be able to move from simple to complex problems, routine to non-routine problems and take their problem solving skills and apply it to new situations.”

“With the combination of problem solving and skills, kids can remember concepts when they go to concrete to pictorial to abstract, and understand why math works, not just how,” said Tirrell, who worked on the Curriculum Committee.

Culbertson said the new curriculum has been evaluated internationally and Singapore has consistently placed in the top three spots in the Trends in International Mathematics and Science Study during the past 12 years.

“Students using the curriculum tested significantly better than others,” Culbertson said. “This is a curriculum that has a track record.”

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