



October 10, 2011

New science curriculum seen boosting Manchester Essex

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MANCHESTER — Last year, the Manchester Essex Regional School District introduced an innovative new science program at Memorial Elementary and the middle school, hoping to rectify what officials saw as a longstanding hole in the district's curriculum.

Now, district officials are hoping to take the program a few more steps forward.

Developed since 2005 by a small team of teachers and science journalists in Salem, the KnowAtom Interactive Science Curriculum aims both to standardize and advance students' knowledge and understanding of science and its underlying principles.

One of the team members is Maryellen deLacy, who taught math and science for many years in Manchester before her retirement.

"It's a local program, and a 100 percent match to the state standards," says the school district's curriculum director, Scott Morrison. "The hands-on nature of it is great. They have really integrated hands-on activities."

The KnowAtom curriculum stresses an applied understanding of the Scientific Method and Engineering Design Processes at all levels, asking that students at all levels perform real experiments as well as design and build projects to perform certain tasks.

The program emphasizes "developing your theory on how something may or may not work, then testing and retesting it," Morrison says. Furthermore, "every student keeps a lab notebook."

"We stress writing across the curriculum," he said.

The upcoming national educational "common core" standards, in which Massachusetts played a strong part in developing, will emphasize engineering and technology programs as well as more traditional topics. KnowAtom, Morrison says, retains a good balance between the physical, life, earth, and engineering branches of science education.

The third, fourth, fifth, and sixth grades were all introduced to the KnowAtom program last year, after which they showed marked improvement over past years in MCAS scores.

After a Boston Globe report placed Memorial's fifth grade in 202nd place for science in 2010, last year's fifth grade moved up to 65th out of 306 districts, and the district expects further gains as time goes on.

However, KnowAtom founder and CEO Francis Vigeant stresses that the curriculum does not focus on standardized testing results to the neglect of a deeper education in science:

"Students are learning how to think logically and solve problems and design solutions in general," Vigeant says. "That's been missing in education for a while."

"I would blame No Child Left Behind, a lot of the standardized testing," he says, "because it leads to a focus on dealing with test-taking strategies. But you see kids, when they learn how to use these processes, really show results in tests. If you can think your way through, you've got the vocabulary down, it really gives the kids a heads up."

Vigeant, who teaches a very high-ranking, multi-level science classroom in New Hampshire once a week, used the example of a class discussing buoyancy.

"You might be doing an experiment asking if there is a difference between salt water and fresh water. That's the scientific method," he says. "Then you design a boat to go in the ocean and carry a certain amount of cargo."

"It gets the kids involved in the content hands-on — they're not just learning from a textbook. They're working with the concepts physically ... we're taking the science lab that you might see in high school and bringing it down to the elementary school level."

Vigeant uses his KnowAtom curriculum in New Hampshire, testing it out himself.

"It's great to stay connected with kids, to make sure that what we're putting into our products is not only tested by teachers but we're testing it ourselves."

This year, about 6,000 students are using the KnowAtom curriculum, Vigeant says, but numerous other school districts are "in the pipeline."

The new curriculum is designed to benefit teachers as well as students.

The KnowAtom program provides all the necessary materials, Morrison says, so that teachers don't need to piece lesson plans together on their own. That's of particular benefit to elementary school teachers at both Memorial and at Essex Elementary, since they must teach all subjects and may not have specialized training in science.

Memorial teachers have already been trained in how to teach the new curriculum, and will receive further training as time goes on, Morrison says.

The main focus, though, remains on the students, who will benefit from the "even playing field" of a standardized curriculum, Morrison says.

"Everyone's teaching the same concepts at the same level at the same time," he says. The program also "has a spiral component, so concepts and topics build off of each other," he says.

First- and second-grade curricula are already available from KnowAtom, and the school district will adopt them soon. Vigeant reports that seventh and eighth grade programs should be ready for next school year, too.

"To get to that No. 1 place," he says, "it takes effort, but they've got everything in place to make that happen."

"It's become more commonplace for us," he adds with a grin.

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