

Dallas elementary students tackle science without textbooks

□ New curriculum is truly hands-on

By ERIN YOUNGMAN
Post Staff

DALLAS TWP. — Something is stirring in the Dallas elementary schools. Instead of just reading about science, students are being asked to question, hypothesize, and experiment their way to scientific knowledge.

On a regular day during science in Thomas Duffy's fifth grade classroom, and students are brimming with excitement. The new science program in the Dallas elementaries has kids getting their hands dirty to come up with their own solutions to scientific questions.

"All it is, is science journals, there are no texts," said Duffy.

Starting this year the Dallas school district significantly changed the way its elementary students learn about science. They decided to opt out of traditional textbook science and into a hands on manipulatives curriculum called FOSS—Full Option Science System.

Developed by the Lawrence Hall of Science at the University of California, Berkeley, the program is "inquiry based," which means students are expected to pose questions and work actively to achieve answers. All concepts are taught through experimentation.

The kids seem to like the new program. During science lessons in which they are broken into small groups, they are enthusiastic, engaged and somewhat competitive with their neighboring groups — everyone is focused on how and who will achieve the desired result.

"It's awesome, it's better than sitting. Mr. Duffy always says it's better to do it than to read about it," said Amanda Walton as she and her two partners worked on their project.

"Traditionally we relied more on reading. The (model) was reading and vocabulary first. Now it's all experiments, then vocabulary and reading," said Duffy.

Students were learning about electricity and circuits on a recent day in Jennifer Gibbons's third grade class.

"Your challenge today is to light this light bulb. I'm only going to give you two wires and a D cell," said Mrs. Gibbons to the students.

Each child in the class was instructed to draw a picture of wires connecting to a battery and a light bulb in the way they thought would light the bulb.

"Test each other's drawings to see if you can get the light bulb to work," said Gibbons.

Some students jumped up and down with pride and excitement as they got their light bulbs to work.

"They're so excited when they can see what they can do with their own hands," said Gibbons.

Dr. Michael Speziale, assistant superintendent at Dallas, said it was through his work as president of the Pennsylvania state team for math, science and technology that he started becoming aware of manipulation based science.

He said when the state adopted new science standards last year, the faculty started talking about how to meet those standards. A group of faculty members volunteered to be part of a science committee that looked at a number of different curriculums. Speziale said they settled on FOSS, partly because it is



Third graders Alyx Koehler, Cody Cleaves, Amanda Kotch and Jeff Allebaugh use only two wires, a battery and their ingenuity to light a light bulb during a lesson on circuits.

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geared to meet all the standards. (The state will start testing in science in 2004; currently reading and math are tested.)

Speziale said the initial cost of the curriculum was comparable to a new set of textbooks; however, FOSS kits are full of consumables that will need to be replaced annually.

According to Speziale, the new curriculum has children posing

scientific problems and then investigating those problems based on what they know and what they learn along the way.

"It's inquiry based. Kids construct their own knowledge; it helps them develop problem solving skills," said Speziale.

Kathleen McCarthy, principal of Wycliff Elementary, said this kind of science program will help to better equip students for the 21st century.

"Being able to create your own knowledge is critical. They have

"Kids absolutely love to do experiments."

Thomas Duffy
5th grade science teacher

to be comfortable in process and figuring things out," said McCarthy.

Duffy, who was on the science committee, said a major reason for choosing the program was that it is one of only three that are recognized nationally, as an "exemplary program." It is recognized by the National Science Teachers Association (NSTA) and was recently on a federal government listing of "promising new programs." "It's correlated to the NSTA standards," said Speziale.

"We felt like even if there were things we didn't know about it, if there are only three that are nationally recognized, we felt we couldn't go wrong," said Duffy.

"No more 10 pages and five questions at the end. We used to memorize for the test and then it would be gone," said Gibbons.

McCarthy said she has always wanted a hands-on exploratory science program.

"It's the kind of science that kids see as an exciting activity. They approach it in the spirit of play," she said.

In Duffy's fifth grade class, the children write out their plans to solve the scientific problem of the day and then share them with the class. Halfway through their experiments, Duffy gathers the kids around and leads a discussion on their progress and questions. The students critique each other's ideas, ask questions and offer suggestions. They wrap up their experiments by writing their conclusions in their journals.

"One of the most important jobs of a scientist is to try to record everything you did so another scientist can take the information and expand on it," Duffy said to the children.

"Kids absolutely love to do experiments," said Duffy. "The motivation is that you give them their own materials, to do what they want to; that's a big deal to them," he said.



Fifth graders Amanda Walton and Carly Huff's problem solving skills are put to the test as they implement their hypothesis for separating dry mixtures.



"Hands-on" best describes the new Dallas Elementary science curriculum, which stresses experimentation.

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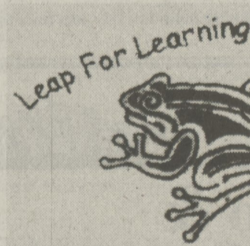
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