

science: an educational MELTDOWN



RANDY BORST/staff photographer

Harrison physics students Jenny Rick (left) and Michelle Malotke test the strength of their toothpick bridge by adding crushed stone to a bucket.

Toothpicks find another purpose in physics class

By Casey Hans staff writer

When is a toothpick at its best? When it's tested as part of a physics class project, where students design and build miniature bridges from the small wooden slivers to see whose project can hold the most weight.

It was senior Michele Rebioy who won honors this month at Harrison High School in Farmington Hills, as she watched her bridge withstand 138 pounds of weight, boasting the school record for the project.

"She was the all-time winner," said physics teacher Dennis King, who said Rebioy beat the project record by about 10 pounds. The bridge project is designed to offer physics students extra credit.

According to King and the laws of physics, it's "not how many toothpicks you use, but how you use the toothpicks. The idea is to build a bridge which will carry the most weight compared to its own weight." King allows all his students to work on the "toothpick bridge" project each year, as a way of applying what they learn. Students also build "mouse-trap cars" and do other hands-on projects.

"WE USUALLY try to make it fun," King said. "Students realize physics is a great class to prepare them for college. It teaches problem solving."

Students in Farmington's three high schools can take Physics, Conceptual Physics (which doesn't use as much math), or Advanced Placement Physics, which teaches college-



RANDY BORST/staff photographer

level concepts and was taught for the first time in the district at Harrison last year.

This year, there is no Advanced Placement Physics because not enough students signed up for the class. But there are full sections of both regular and "conceptual" physics classes, King said.

Many students took the AP version last year, so they would have a head start entering their first year of college, he added.

Harrison physics teacher Dennis King explains to students what it takes to build a strong toothpick bridge.

Science shift taking effect

Continued from Page 1

- Increased graduation requirements to two years of high school science.

- Placed a priority on putting "science rooms" in all elementary schools. So far, there hasn't been space to develop them.

A KEY improvement is the strengthening of communication in different levels of the science department. The Farmington school district is linking teachers at the various grade levels so they can share information.

"We're working on that now," said Kathy McAdaragh, science coordinator for the district. "Traditionally, it hasn't happened too much."

The rewriting of science curriculum that started last year helped draw teachers together.

"The curriculum writing time gets teachers together," McAdaragh said. "That time is very valuable for them. They can talk together, and share experiences."

The Farmington district faces a dilemma common to other districts — state-mandated test scores that show science proficiency at nearly half the levels of mathematics and reading. New to the Michigan Education Assessment Program, science testing has raised new concerns about not only what students are

learning, but when they are learning it.

This year's senior class is the first to graduate under a "minimum ten years of science" requirement, although department heads at all three high schools say more than 80 percent of their students were already taking two years before the requirement was passed. The school board passed the new requirement in May 1986, after national and state reports, and a survey of Michigan residents, suggested two or three years minimum of science education.

The change may be positive, especially for students who shy away from the sciences as they reach high school.

"A small percentage still have that attitude, 'I'm not any good in science,'" said Roy Lewis, science department head at Harrison High. "Once they get into it, they lose that."

"Science is not always the easiest thing to study," added Bob Neuhauer, department head at Farmington High School. "Kids start out interested in it (at lower grade levels), then when it gets to be work, they stop. This district is probably better than most."

Bob Winters, department head at North Farmington, believes today's students realize they need science education.

"Even though our enrollment has dropped, the number of students taking science courses hasn't changed," he said. "Kids realize they need a variety. The need has increased — I know there are students who do perceive that need."



Judith White

O&E Sports—more than just the scores

Grades 1-12: a science primer

Science curriculum in Farmington Public Schools is structured to flow from level to level, and grade to grade as follows:

- Grades one through three are taught by classroom teachers. Hands-on teaching is encouraged.
- Grades four and five are taught by classroom teachers with an additional 40 hours per week handled by one of four science consultants. Each consultant is responsible for several elementary buildings.
- Grades three, four and five also have outdoor education. Third graders have a half day wilderness program. Fourth graders do an outdoor classroom teacher and three parents at the Fairview Outdoor Center and Trail. Fourth graders do an outdoor wildlife discovery and fifth graders get a full day

at the Walled Lake Outdoor Center with their teachers.

- Sixth graders get general science education, with a concentration on earth science.
- Seventh graders are taught life science.
- Eighth graders are taught physical science.
- Students in grades nine to 12 at the high school level can choose from the following courses, depending on grade level. What is actually taught is dependent on how many students sign up: Biology, Basic Biology, Biology II, Advanced Placement Biology II, Geological Science, Basic Geophysical Science, Chemistry, Descriptive Chemistry, Physics, Conceptual Physics, Accelerated Physics, Advanced Placement Physics or Anthropology.

Changing world modifies approach to education

By Casey Hans staff writer

From far-reaching technologies to polluted waters and threats from harmful substances, everything is affecting the way we look at the world and learn about it.

These things affect the way science is taught today, according to those who teach and plan curriculum in the Farmington school district.

"There's a lot more technology today," said science coordinator Kathy McAdaragh. "Science wasn't viewed as relevant before."

Things like environmental issues bring science home, she said. "All of a sudden it has personal relevance."

Computers are "one of the biggest things" to hit science education, according to Bob Winters, teacher and science department head at North Farmington High School. "It will get bigger as more programs become available. Programs will become more lab-oriented."

Earth's fault systems, drilling for oil and other concepts. The programs give students a chance at deductive reasoning.

He gets the computer programs free through a computer consortium to which the district belongs. Three or four programs are added to the collection each year. Jahn works toward using them as a teaching tool tailored to his class.

"We'd like to do a lot more of it," he added. "We're trying to integrate computers more into the classroom."

At Harrison, Jahn has access to seven computers if he needs them, but says all three high schools have screens that can project a computer image.

Farmington High School science teacher and department head Bob Neuhauer is looking to more new technology planned for his school's revamped media center.

"There has been some declining in advanced classes," he said. "Hopefully, innovations in the media center will help."

The new media center will eventually be tapped as a resource by all schools in the district.

"Ecology and the environment, ethical issues. Not making value judgments — just discussing the issues."

She used the radon gas problem as an example. The government is recommending that all homeowners in affected areas test the lower levels of their houses for the build-up of the gas, which can cause health problems. "Wherever we are, you use the teachable moment," she added. "Get the kids involved."

North Farmington High School teacher Virginia Lambert is using the issue of water quality in her biology classes to get her students interested.

North Farmington is one of more than 30 schools involved in an ongoing study of the quality of the Rouge River, which runs through the Farmington community. Working with other students, a team from the University of Michigan and the Friends of the Rouge, the project offers students some hands-on experience in an issue of relevant concern.

THE USE of "DNA fingerprinting" by law enforcement officials in cases involving several Oakland County rapes in 1988 gave Harrison science teacher Roy Lewis a chance to give his students a realistic look at the DNA concepts this year. The "genetic fingerprinting" DNA method allows very accurate matching in criminal cases, tying suspects to evidence.

DESIGNER

CAROLINA HERRERA

See the complete spring '89 collection of Carolina Herrera informally modeled, January 25, 10 a.m. to 6 p.m. and January 26, 10 a.m. to 4 p.m., in our Birmingham store. Expect light dressing... in color, in silhouette, in attitude. Clean and classic lines for day, late day, and evening. To carry into the 90's, purity of design and timeless elegance...the signature style of Carolina Herrera.

Jacobson's

We welcome Jacobson's Charge, MasterCard, VISA, and American Express. Shop until 9 p.m. on Thursday and Friday, until 6 p.m. on Monday, Tuesday, Wednesday, and Saturday.