

## LINCOLN PARK

# Four take part in scientific experiment at tech school

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Staff Writer

Two teachers and two students from Lincoln Park Middle School are part of a scientific experiment, and the four of them will bring it back to their home school in the fall.

Science teacher Robert Neal and computer teacher David Winston have spent the past two weeks learning how to build an underwater robot – and more importantly, how to teach their students to build one – at the BUILD IT program at Stevens Institute of Technology in Hoboken.

This week the teachers brought in their so-called guinea pigs – rising eighth graders Kyle Tizio and Attila Toke – to see how their students would take to the experiment.

“It’s better than I thought it would be,” said Tizio of the “summer camp for smart kids,” as organizers called it.

“I was picturing nerds with pocket protectors,” he clarified.

Instead, the Lincoln Park delegates found teachers and students from 18 schools just like theirs, all eager to get their hands on robotics equipment and get their learn on.

The BUILD IT program is part of a National Science Foundation (NSF) initiative to encourage students to pursue degrees and careers in engineering and technology. By using concepts taught in the classroom to apply to real-life situations, educators hope to get more students interested in engineering and technological careers.

The two teachers participated in an intensive two-week institute that began on July 23 and taught them how to design, build and test underwater vehicles to complete a set of underwater challenges,

including underwater basketball.

This year, the teachers are learning about building the robot, and next year, they will learn how to advance the project so it is maneuvered wirelessly by computer controls.

The teams spent the mornings in workshops exploring concepts in science, technology and education and the afternoons designing and building the robot.

Last week, Neal and Winston took top place in a competition among the teachers, scoring the most baskets in a 5-minute period. Tizio and Toke hoped to outscore their teachers in Friday’s competition.

On Wednesday, the two had not named their robot. But upon hearing that the winning vehicle in the previous week was named Gryphon, after the middle school’s mascot, they quickly settled on Gryphon 2.0.

“Their design is definitely similar,” Winston said of the Gryphon 2.0, but the pupils interjected that it would prove to be better.

The robots are manipulated with two controllers that are connected by wires, splitting up the controls for moving up and down and left and right, as well as the grabbers it uses to pinch objects under water.

“They have to not only build it together, but they have to control it together,” Neal said.

Neal and Winston are excited to take the new lesson, as well as the \$3,000 worth of equipment the NSF grant also provides, back home this fall.

They are also looking to start up a robotics club with the FIRST (For Inspiration and Recognition of Science and Technology) organization.

## Engineers wanted

The efforts of Neal and Winston, as well as all of the other educators participating in the BUILD IT program, are part of a movement to encourage adolescents to consider careers in science.

“We’re trying to get the middle and high school students interested in engineering,” said Dr. Rustam Stolkin, a professor at Stevens Institute of Technology and leader at BUILD IT.

The program started out a few years ago as a smaller experiment with just a few high school students, and now it is utilized with all Stevens’ undergraduate engineering students.

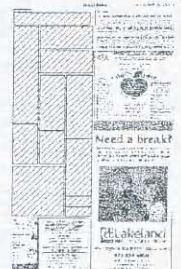
Not only are fewer students enrolling, but many of those completing coursework at American engineering schools come from foreign countries, he said.

According to the National Science Board, 29 percent of all science and engineering degree holders in the U.S. labor force and 44 percent of all science and engineering doctorate holders are 50 or over, said Beth McGrath, director of the Center for Innovation in Engineering and Science Education at Stevens Institute.

This means that over the next 10 to 12 years, between a third and a half of the science and engineering workforce is expected to retire. And the situation is particularly acute in some industries, such as defense and aerospace, where the United States cannot import foreign nationals to fill those vacancies, McGrath said.

“Programs like BUILD IT and others that the National Science Foundation is sponsoring around the U.S. are focused in increasing the pipeline of students who will go on to be America’s technical talent,” she said.

Stolkin added that part of the program also hopes to show that



# Suburban Trends

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both college and middle school students can complete the same project and, as a result, better understand how concepts learned in the classroom apply to real-life situations.

He has found that pre-collegiate instruction may be lacking in some areas.

"I can't teach structural engineering without stopping every five minutes to give a math lesson," Stolkin said.

Projects like BUILD IT bring to the forefront concepts like physics, buoyancy, Archimedes' principle, mathematics, electronic systems and computers.

From their initial exposure to the new science and the overall project, Toke and Tizio said they had seen a different side of engineering and realized what lies ahead.

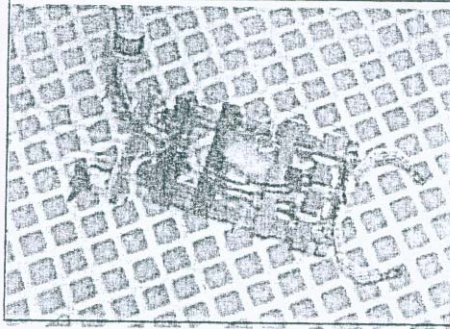
"It seems like it could be a good career," Tizio said.

Neal said one particular presentation put things into perspective well for the students who don't remember life before the Internet. The message of the session was

that many of the technological breakthroughs that have changed daily life have taken place in just the last 15 years, and an undeterminable number will likely come in these students' lifetimes.

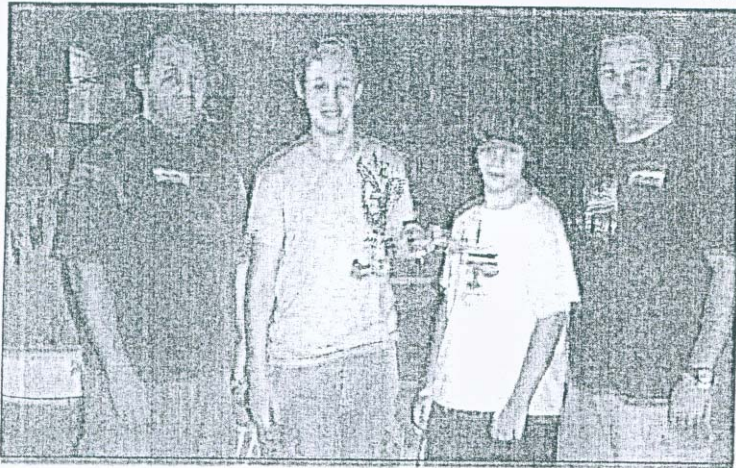
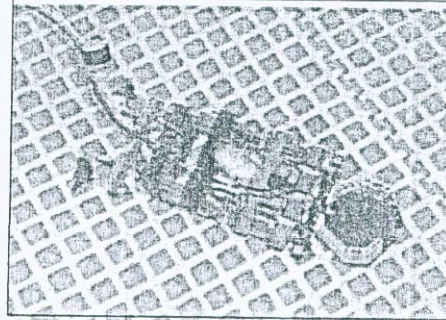
"Maybe we could be making these changes," Toke said.

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The Gryphon 2.0 prowls through the water looking for objects to grab with its pincers. The underwater robot was built and is controlled by Attila Toke and Kyle Tizio, two Lincoln Park Middle School students.

The underwater robot constructed by two borough middle school students, who were taught by teachers Robert Neal and David Winston, grabs an object and shows off its strength.



PHOTOS COURTESY OF ROBERT NEAL

(L-R) Lincoln Park Middle School computer teacher David Winston, students Attila Toke and Kyle Tizio, and science teacher Robert Neal show off their underwater robot they constructed at the BUILD IT program at Stevens Institute of Technology. The program aims to get more students interested in engineering and other scientific careers by introducing the collegiate-level project in middle school classrooms