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Taking stock in trees

By **Christopher Rocchio**/ Daily News Staff

Thursday, July 27, 2006 - Updated: **01:57 AM EST**

CHESTNUT HILL -- What if half of Waltham High School's parking lot was replaced by two dozen trees? What impact does the noise produced by vehicles on Rte. 128 have on the city's bird population?

Ninth-grade students in Waltham will soon have the opportunity to address those questions and more as the district is looking to implement a new way of approaching its science curriculum. Heidi Sardina, an eighth-grade science teacher at McDevitt Middle School, called it a "spiral" curriculum.

"Instead of taking a straight-science course, like biology or chemistry, the new curriculum will take different aspects from all those subjects so students can see the total picture," said Sardina. "It will allow the students to make more connections between everyday life and what they're learning."

For the past two weeks, Sardina has been taking a professional development course at Boston College that should aid the spiral curriculum's implementation. Along with 34 other teachers, the course also has 59 students from Boston Public Schools enrolled in it.

All involved have been conducting a tree analysis of the Chestnut Hill/Newton area using a geographic information system (GIS), and have also been doing a bioacoustic analysis with the use of a sound visualization program. Mike Barnett, a Waltham resident and assistant professor of science education and technology at Boston College's Lynch School, said the teachers have also received lesson plans that will help them install similar programs into their regular curriculum.

"It leads the students to ask very interesting questions that do not have predetermined answers," said Barnett. "The solution is based on whatever the students are interested in."

For example, he said students at this week's program have been collecting data on different trees around Chandler's Pond in Brighton, including height, width, age and health. He said those are important indicators of how fast a tree grows and how much carbon it consumes, a significant factor in global warming. Using that information, Barnett said students then begin working with a GIS program to understand the value of those specific trees in terms of their water run-off, air pollution removal, carbon storage and cooling effects.

"The GIS has a very powerful way of allowing students to visualize information," he said. "Oftentimes kids see it in data tables. Now they can actually see it on an interactive map."

Barnett said every region of Massachusetts has a satellite image that is available for download, including Waltham. Using the program and information collected, Barnett said students are able to simulate different scenarios to see what impact it would have on the community. Thus streets and parking lots could be transformed into green space, and forests could be turned into dense commercial areas.

"The tree analysis has connections to evolution, engineering, environmental science and math," said Sardina. "If the students can apply what they're learning, they can understand it."

Meredith Howle, a BC doctoral candidate, said students enrolled in the program are also exploring how noise impacts birds in a city. After students went out and recorded decibel measures of the city as well as bird songs, Howle said they studied different frequency ranges and the loudness levels of each.

"There is no answer yet in the scientific community of how birds communicate in



Instructors Reni Driskell, left, and Elizabeth Walsh, center, discuss the condition of a tree on the Boston college campus as Stavri Japo, a senior at Odyssey High School in Boston looks on. (Mike Springer photo)

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an urban environment," said Barnett. "It's not the typical classroom question because it's just starting to be asked by scientists, so it's pretty cool for students to be working on it."

Sardina said she is excited about the professional development opportunity, allowing her to work with college professors, speak with real experts in the field, and learn cutting-edge technology. She said she is also looking forward to implementing what she's learned into Waltham's ninth-grade science curriculum and the middle-school's Mall Mania program once the school year begins.

"The programs will give students the chance to actually experience what they are learning, so it will make a lot more sense to them," said Sardina. "They won't just be learning science, they'll be participating in it."

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bh.heraldinteractive.com: 0.033768:Thu, 27 Jul 2006 05:57:17 GMT