



## Youths get jump on cybersecurity

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Dayton students learn about cryptology, too

Fifth-grader Brianna Mentle learned how to program an animated breakdancer to move around a screen with changing background scenes and music and to program a simple video game that has a turtle as its main character.

As a student in an introductory information technology course, she's having "lots of fun." But she's also learning about the serious worlds of cybersecurity and information assurance along the way.

STEM Mindtools, an innovative program held at Dayton Oaks Elementary, hopes to strengthen the pipeline for information security by introducing the concepts of programming and cybersecurity to a younger audience. All 19 of the participants are fourth- and fifth-graders from the school.

"It plants a little seed," said Davina Pruitt-Mentle, Brianna's mother and the instructor of the program. "I'd like to see if the kids keep an interest through middle and high school."

The after-school course, which began in October and ran through Dec. 8, introduces fourth- and fifth-graders to programming and cybersecurity through simple, fun exercises and projects aimed at diffusing the intimidating aura that these topics tend to give off. Eight one-hour classes, held in Dayton Oaks' media center computer lab, included the use of various computer programs and online exercises. Dayton Oaks is the only elementary school offering the National Science Foundation-funded STEM Mindtools program in the state.

Students learned how to program in Microsoft Excel by using the "if", "and" and "or" functions. Through the use of MicroWorlds, which uses the Logo programming language -- which is nonlinear, meaning that the same objective can be reached through various methods -- the students moved and gave commands to an animated turtle. With Scratch, another program based on the Logo language, kids created animated scenes by dragging and dropping preset commands and inserting numerical details, such as how many degrees an object should move in a certain direction.

Pruitt thinks the non-linear quality of the programming is ideal for this age group. "There are 16 gazillion ways to do the same thing. It gives kids the creative freedom to do things on their own and allows for differentiated learning."

The course also included a unit on cryptology. The kids were taught how to use a paper cipher wheel, learned the basics of how computers break codes and completed online cryptology games. Pruitt-Mentle also instructed the students on the basics of cyberethics, cybersafety and cybersecurity.

The curriculum also incorporated elements of the kids' current math courses and exercised their problem-solving skills. They learned how to debug-- trying to find out why something doesn't work --- with the help of group input.

The second portion of STEM Mindtools, a sequential curriculum, begins in January and will include 10 sessions. This section will focus on robotics and will include instruction from graduates of the pilot program, held last year at Dayton Oaks, who have gone on to Folly Quarter Middle School.

On the last day of class, parents were invited to view some of their childrens' projects. One student created a game in which a car has to pass obstacles to reach the road. Another one made a game in which a squid is trying to get some chocolate cake. Like Mentle, Allison Seibert programmed an animated breakdancer to move to beats with switching backgrounds.

"I think it's a great program," her father, Eric Seibert, said. "It's the future for the kids."

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