

Getting a grip on new technology

Students at Vertus Charter School are using 3-D printers to make affordable prosthetic hands

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Lashawn Cason, 16, has his first part-time job this summer: 20 hours a week, \$8.75 an hour. But don't look for him at the drive-thru window.

He and 11 classmates at Vertus Charter School are making prosthetic hands on a 3-D printer and using a computer modeling program to design and print accessories. Cason is working on a cup-holder to supplement the hand's grip.

"It's complicated," he said. "But I can do it."

The six-week program, funded through the city of Rochester's Summer of Opportunity, is a partnership with Rochester Institute of Technology and the e-NABLE Project, which harnesses volunteers and 3-D printing technology to make affordable prosthetic hands.

A traditional prosthesis costs thousands of dollars. The ones made through e-NABLE, founded in 2013 at RIT, cost about \$20 in materials and are provided free of charge. The organization distributes them around the world to children in need.

See **HANDS**, Page [14A](#)



Vertus Charter School 10th-grader Justin McGill adds wires to a prosthetic hand made with a 3-D printer.

CARLOS ORTIZ/ STAFF PHOTOGRAPHER



At Vertus Charter School, 10th-graders Spencer Burns, Giovanni Cintron and Lashawn Cason make prosthetic hands with 3-D printers. The hand they are looking at had been processing for four hours.

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Article Continued Below

[See HANDS on Page A14](#)

Hands

Continued from Page 1A

You can't play the piano with them, but they're good for simple tasks and better than what most children in developing countries would otherwise have access to. The Vertus boys have assembled 31 of them so far and still have two weeks to go.

The school, which just finished its first year serving ninth-grade boys, bought three 3-D printers for \$2,000 each, co-founder Perry White said. Students who did well during the school year were invited to participate.

"We've learned a lot about what works and doesn't work with our students this year," White said. "What works is interesting work that they understand to be part of the real economy, particularly technology."

The students also have been working on writing résumés and other job preparation tasks two days a week. The school, off Lyell Avenue, is working with RIT to find other ways to incorporate the 3-D printers into its curriculum after the summer.

It is expanding to serve boys in grades 9-12, with computer-based learning and individual attention from mentors, or "preceptors." This summer, a partnership with the teaching program at The College at Brockport led to intensive one-on-one reading help for 32 students.

Results from the first year were encouraging but show the difficulty in the work: Test results show the ninth-graders on average jumped two reading levels from September to June, from a fifthgrade level to seventhgrade.

The summer program is the first job for 15-yearold Spencer Burns as well — he probably would have spent his summer playing basketball, but decided he wanted to do something different. He is trying to incorporate a video chat screen onto the wrist of a prosthesis, like a built-in Apple Watch. He said his first year at Vertus helped him refocus on academics and start thinking about a career path.

"My grades are up — I didn't fail a single course," he said. "It seems like they care for you more than others do." Charles Ruffin wants to become a nurse, but took an interest in the prosthesis printing as a way to "stretch my mind out." He came from East High School, where he got good grades but also spent too much time clowning around. At Vertus, he rededicated himself.

"My mind was fixed that I wasn't going to like it, but it just grew on me," he said. "Once I got here, I said: 'I'm in ninth grade now. It's time to get focused.'"

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The prosthetic hands that Vertus Charter School 10th-graders are making with 3-D printers this summer are distributed around the world to children in need.

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