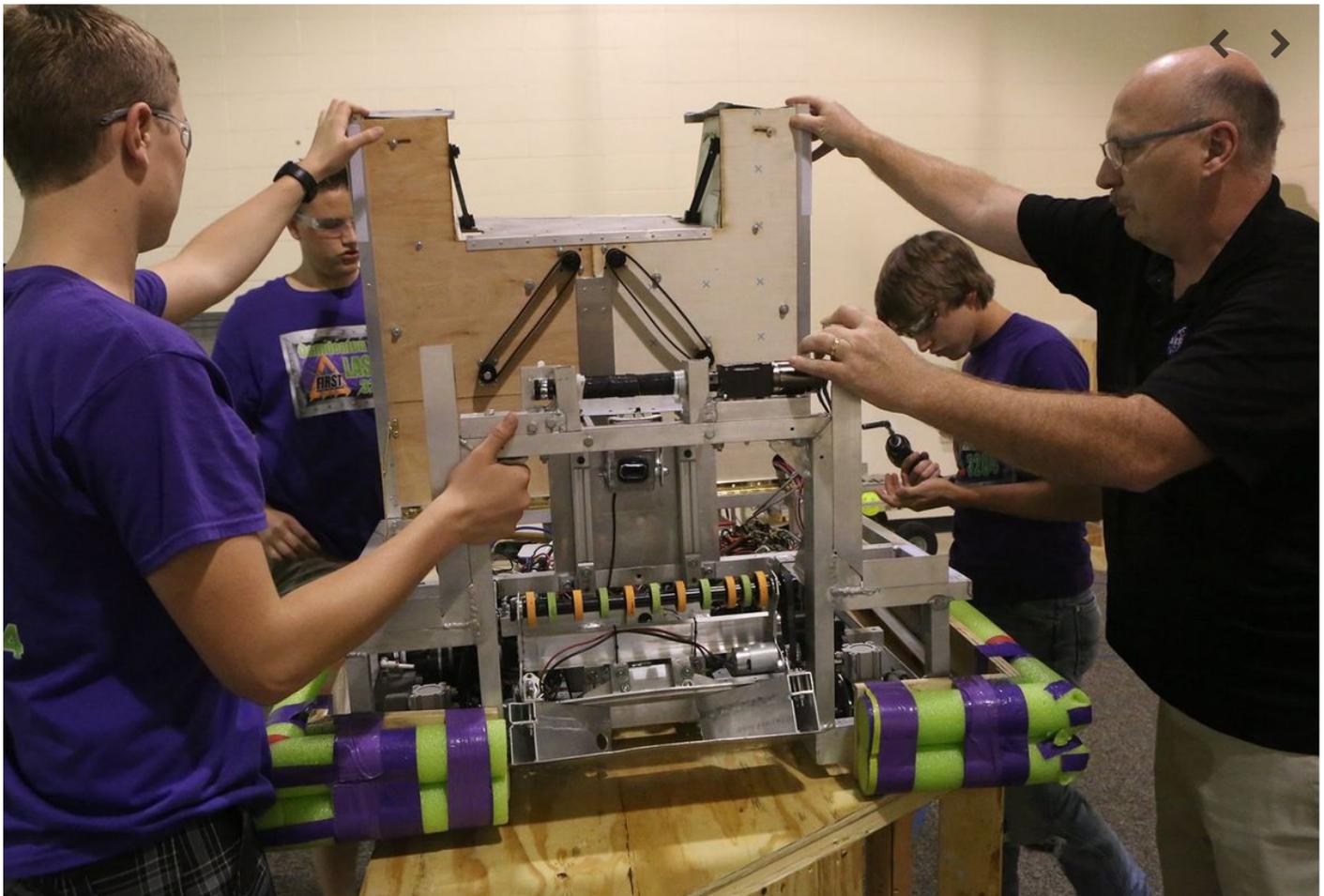


# EDUCATION

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## Tiny Camdenton is home to one of Missouri's best high school robotics programs

By Kristen Taketa St. Louis Post-Dispatch Apr 25, 2017



Camdenton High School students work on the robot they built from scratch in Camdenton, Mo., on Tuesday, April 18, 2017. They are from left: Lucas Mosher, 16; Jacob Vance, 16; Eli Mangone, 16, and robotics coach Mitch Comer. The team was replacing some of the gears in preparation for competition in St. Louis this week. Photo by J.B. Forbes, [jforbes@post-dispatch.com](mailto:jforbes@post-dispatch.com)



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**CAMDENTON, Mo.** • In a rural central Missouri town of 3,600 people, teenagers are making robotics as cool as football.

Those teens include Catherine Sauer, 18, who is working on programming robots to see by themselves — something many college students don't learn how to do. Eli Mangone, 16, welds aluminum — which is one of the hardest metals to precisely weld without warping — into the frames of robots. Josh Harmon, 16, uses software to design a more than 100-pound robot based on his team's priorities for speed, sturdiness and function.

“Once I got involved, I saw that it's really cool,” Catherine said. “It's outside of the classroom, so it's not just like homework and the boring stuff that you have to learn in a textbook... In robotics, it's not word problems. It's an actual application.”

Catherine, Eli and Josh are members of the LASER 3284 robotics team — not club, the students stress — at Camdenton High School, the single high school in a rural school system of 4,200 students that covers 350 square miles around Lake of the Ozarks.

For a long time, the district's greatest renown was its football program, which has won five state championships.

Now, the district has arguably become a Missouri capital of youth robotics. And it has done so without many of the advantages of affluent suburban schools, many of which enjoy high-dollar support from nearby corporations.

On Wednesday, LASER 3284 will join 17 other Missouri high school teams and hundreds of others from around the world in St. Louis for the annual FIRST robotics championship.

“All school districts are known for something,” said Camdenton Superintendent Tim Hadfield. “This has been one of the things we’ve wanted to hang our hats on.”

Robotics is in such high demand here that the schools have to hold lotteries for spots on elementary teams. Almost 300 students were turned away just this year. One in 14 students districtwide is somehow involved with the after-school robotics program. Founded in 2009, Camdenton’s robotics program is one of the fastest-growing in the country.

The district has more robotics coaches than football coaches. The high school team brings in awards from regional competitions and thousands of dollars in prize money and sponsorship year after year. The high school students’ level of engineering skill puts the education of many adults to shame.

This month, when the high school team returned victorious from a competition, the school held a balloon launch to celebrate — just like it does with the football team, after-school activities director Sherry Comer pointed out with delight.

“Last summer, I was reading an editorial in the newspaper,” said robotics coach Mitch Comer. “I knew we had done something when they said, when they hear Camdenton, they think of our robotics and football.”

## Homegrown success



Lucas Mosher, 16, looks at the robotics model the younger elementary students were making in the after school program. Mosher is a mentor to the younger students. Camdenton elementary school students were participating in the robotics program in Camdenton, Mo., on Tuesday, April 18, 2017. The students form groups and decide what kind of lego model they will make. The requirement is that each model have one moving battery-operated part that is controlled from a computer tablet. Photo by J.B. Forbes, [jforbes@post-dispatch.com](mailto:jforbes@post-dispatch.com)

Camdenton's robotics program began when Comer, a technology teacher at Camdenton High who was born and raised in rural Missouri, attended a conference in Kansas City.

He heard other educators talking about their robotics teams and the big sponsorships they enjoyed from places such as the Kansas City-based Kauffman Foundation that were right in their backyards. The resources they had, which are often harder to procure for rural schools, inspired Comer.

He became determined to bring an opportunity like that to his own students in Camdenton, which sits hundreds of miles from major companies such as Boeing.

For Comer, a school robotics program also signified a kind of personal redemption. When he was in high school, he dropped out of geometry class because his teacher couldn't show him how the math he was learning applied to the real world. It's a regret he still can't shake today.

"I don't want the kids to make the same mistake I did," he said.

He and Sherry Comer, his wife, built a robotics program for Camdenton together.

One problem was funding: being too far away from major companies and nonprofits based in the cities, they didn't qualify for many grants or sponsorships. The first grant came to them from J.C. Penney for \$10,000. Later, they no longer qualified for the grant because they were located too far from a store, Mitch Comer said.

But their students went door to door looking for sponsors, asking the local chamber of commerce, the local Optimist Club, car dealerships and more.

Sherry Comer secured federal after-school activity grants. They found a few professional engineering mentors — a key part of a robotics team's success — at a small firm in Lake of the Ozarks.

Now, the program is largely funded by sponsorships that the students procure themselves, including one from a company in Japan and one from Boeing. On top of that, the district has embraced robotics, allocating more than \$100,000 to the program this school year. The program has grown from its first class of 21 students to more than 250.

## Getting results



Camdenton High School students work on their backup competition robot in Camdenton, Mo., on Tuesday, April 18, 2017. The two students in the foreground are Jacob Vance, 16, (left) and Josh Harmon, 16. In the back is Brenden Barbour, 18, (left) Coach Mitch Comer, Catherine Sauer, 18; and Lucas Mosher, 16. The competition robot has already been shipped to St. Louis ahead of this week's competition. Photo by J.B. Forbes, [jforbes@post-dispatch.com](mailto:jforbes@post-dispatch.com)

Camdenton's team is organized through FIRST, which was founded in 1989 by engineer and businessman Dean Kamen.

Kamen set out to start not just an organization but a movement, one that would turn robotics into a sport as revered and respected as football and basketball.

FIRST stands for "For Inspiration and Recognition of Science and Technology,"

"Our society just doesn't celebrate the great minds," Mitch Comer said. "We celebrate people who can sing and dance and play sports. But our true heroes are the ones who are going to solve cancer and global warming. We're trying to change that culture ... because math and science holds all the world's problems."

While school officials across the state are rushing to adopt science, technology, engineering and math — or STEM for short — curricula and programs to make their schools more attractive and competitive, students and staff have invested much time and energy into Camdenton's robotics program. And that careful investment produced an impressive track record.



Emily Haas, 9; and Kasee Westhoff, 9, work on their team's lego model. Camdenton elementary school students participate in the robotics program in Camdenton, Mo., on Tuesday, April 18, 2017. The students form groups and decide what kind of lego model they will make. The requirement is that each model have one moving battery-operated part that is controlled from a computer tablet. Photo by J.B. Forbes, [jforbes@post-dispatch.com](mailto:jforbes@post-dispatch.com)

About 92 percent of its students go on to either study STEM at a university or go directly to work in a STEM field. LASER 3284 has sent alumni to the Massachusetts Institute of Technology, California Institute of Technology, Missouri University of Science and Technology and Stanford University. At least one current student is headed to MIT this fall.

By the time they graduate, the students don't just learn how to build robots, but how to run their own company, speak in front of an audience and work in a team.

The students make their own presentations to prospective sponsors and to judges at robotics competitions.

LASER 3284 students have also helped to start 65 FIRST teams in other schools. They organize and host robotics competitions, programming camps and workshops for coaches.

They even lend their practice robots to other Missouri teams who don't have the resources or expertise to build one on their own. This outreach work won LASER 3284 the prestigious FIRST Chairman's Award this year.

"It's definitely a huge part of my life," said LASER 3284 team member Melissa Stout, 16. "I've learned a lot from being involved about leadership and about different skills that you necessarily wouldn't expect students to learn in a robotics program."



Robotics booms in St. Louis as thousands of students gather to 'compete with their minds'



Lego leagues introduce children to coding and engineering