

# MISSOURI DISTRICT PUTS STUDENTS ON A PATH TO SUCCESS WITH STEM PROFESSIONAL LEARNING



Photo Credit: Knob Noster Public Schools

Missouri's [Knob Noster Public Schools](#) fulfills an important mission in serving military families at Whiteman Air Force Base and within the local community. However, with a highly transient population, Knob Noster faces a key challenge in providing a rigorous education for students.

To address this challenge, Knob Noster has partnered with the [National Math and Science Initiative](#) — an organization that works with communities and local school systems to increase access and achievement in rigorous education, particularly in STEM.

As a result of its partnership with NMSI, Knob Noster has improved STEM education across all levels of instruction. Students can take a wide range of Advanced Placement® courses — and the district has become nationally recognized for putting students on a path to success.

## A MAJOR OPPORTUNITY

Knob Noster Public Schools is among the nation's most heavily military-impacted districts: 70 percent of students are directly connected to military service. The district's superintendent, Dr. Jerrod Wheeler, is a fourth-generation Missouri school superintendent who has served in Knob Noster for eight years.

"Educating military students is something we specialize in here at Knob Noster," Wheeler says.

Knob Noster comprises four schools with two out of three students being military connected: A 100-percent military-connected Pre-K-5 school with about 600 students on Whiteman Air Force Base; a K-5 school off-base with about 45 percent of its 500 students coming from military families; an off-base middle

school of about 380 students; and an off-base high school of about 450 students.

When Wheeler took the helm, the district was emerging from a string of leadership shake-ups and academic program struggles. But, after a conversation with Whiteman Air Force Base personnel, Wheeler was energized and determined to turn around students' academic performance and preparation.

The district realized a major opportunity when it partnered with NMSI, which opened the door for more rigorous learning opportunities for students. This partnership was, as Wheeler put it, the catalyst that got the ball rolling.



## UNIQUE CHALLENGES

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Military-connected families operate under special circumstances, as they typically move every two to three years. Owing to their high mobility rate, children will likely encounter limited opportunities at some point in their education.

“Making sure students have an opportunity to access high-quality and rigorous education programs is critical,” says Ed Veiga, NMSI’s Senior Director of Government and Corporate Relations.

The Department of Defense STEM (DoD STEM) awards funding to NMSI, which in turn awards grants to partner districts. Knob Noster received an NMSI grant in 2015 when Wheeler was hired. With this \$264,000 DoD STEM grant, the district implemented NMSI’s hallmark programs, [Laying the Foundation](#) and the [College Readiness Program](#), beginning in 2016.

LTF helps teachers strengthen their STEM subject matter expertise, enhances teachers’ classroom management and leadership capabilities, and prepares students to take ownership of their learning

## INCREASING COLLEGE OPPORTUNITY

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Military families move often, and many students at Knob Noster previously attended schools in much larger districts — where they had access to STEM courses, AP classes, and rigorous learning opportunities. Knob Noster should be no different in terms of what it can offer students, Wheeler notes.

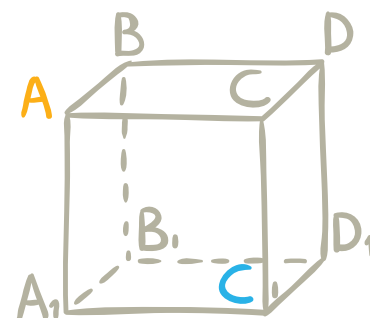
Before partnering with NMSI, Knob Noster offered no AP programming and very few opportunities for students to earn dual credit. Now, the district offers AP courses in Calculus, Physics, Chemistry, Biology, Environmental Science, Literature and Composition, Spanish, European History, and U.S. History — and has plans to add AP Computer Science next year.

as they develop key skills such as creativity, problem-solving, and critical thinking.

CRP aims to increase enrollment and participation in AP® courses and overall college readiness. Administrators and teachers receive hands-on training, support, and resources.

LTF usually targets grades 6-12, with an emphasis on middle and high school. Wheeler wanted every Knob Noster educator to participate in LTF training, which NMSI was able to accommodate through its private training solutions.

“He saw the value. By going through that training, it makes all those teachers more conscious of the quality of instruction they’re providing,” Veiga says. “It’s very innovative — and not something you often see.”



In the first year that LTF and CRP were implemented, NMSI reported that Knob Noster had the highest number of students enrolled in AP courses and the highest number of qualifying scores among participating districts.

“We had immediate energy and success with our AP programming, and that energy has carried through the past five to six years — enrollment is strong,” Wheeler says.

At the start of the 2022-23 school year, roughly 214 high school students out of 450 were enrolled in AP courses at Knob Noster.



# REAL-WORLD STEM LEARNING



Implementing NMSI's College Readiness Program has enabled Knob Noster to offer advanced STEM courses – and 75 percent of students in the district are enrolled.

The district's [FIRST Robotics Team](#), the Knob Noster High School Stealth Panthers, was tasked with [designing and testing a switch cover](#) for a B-2 Stealth Bomber cockpit. The original switch covers generated an issue that prompted a forced landing, and Whiteman Air Force Base personnel asked Knob Noster students to find a solution.

Students designed, tested, and 3D printed switch cover prototypes using STEM, critical thinking, problem-solving, and collaboration skills. Their final switch cover design costs only \$1.25 per unit and is now used in actual B-2 Bombers.

This B-2 Bomber challenge is a terrific example of how access to AP and advanced STEM courses inspires students to think beyond the classroom walls.

“When kids get to do things like that, it opens the door to potential career pathways,” Veiga said. “It helps fulfill a great need in the country for the next generation of people to work in DoD laboratories. As in so much of industry, it’s an aging workforce.”

He adds: “Energizing and mobilizing young students is often very difficult, but this is a great example of how real-world challenges can make that happen.”

Knob Noster has also developed [aviation career pathways](#) allowing students to complete ground school training, complete unmanned aircraft flight operations, and earn a private pilot’s license. In just two years, multiple students graduated with a pilot’s license in hand.

## PROMISING RESULTS

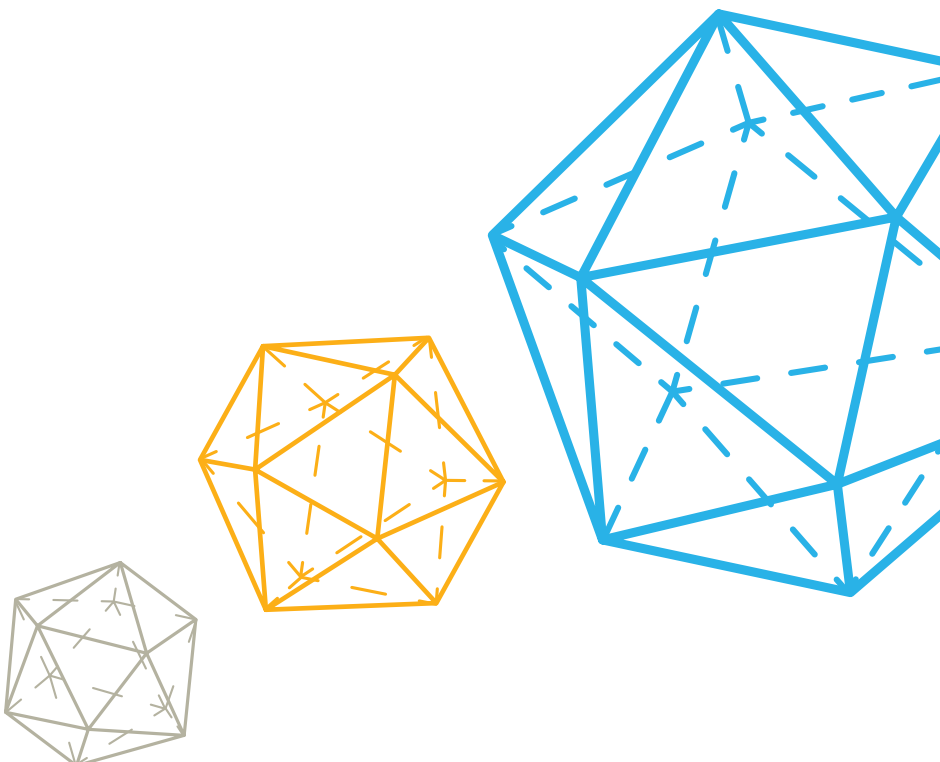
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Wheeler is grateful for the opportunity to partner with NMSI and credits the organization's programs with elevating education within the district.

"I'm so glad we took advantage of this opportunity," he says. "We found that our students are ready for it. They want it, they're capable, and if we raise the bar, they're going to clear it. I attribute our success to having the courage to put these opportunities in front of our students. They're going to nail it every time."

When the U.S. Air Force conducted its inaugural study on the quality of education in 2020, Whiteman Air Force Base emerged as No. 1 out of all 154 installations in the nation. The district's high school also [consistently ranks](#) among the top Missouri high schools in U.S. News & World Report's annual ranking.

"Parents are thrilled," Wheeler concludes. "Many of our families have been here before, and they circle back. What sticks out to me is where Knob Noster is now compared to where it was. It's become a destination of choice for families because of our academic programming. We're setting students up for success in college and careers."



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