Indian River tailors unique STEM programs to schools

*Students at **Indian River School District's Lord Baltimore Elementary** build robots as part of the school's competitive robotics program.*

Editor's Note: The following was written by Michael League and Melissa Bleile, instructional technology specialists for Indian River School District.

Collaborate as a team to build a robot for the robotics competition? Write code for the autopilot of a robot? Use a 3D-printer to make an iPhone case? Build a bluetooth music system for the school librarian? These are just a few of the projects underway as part of the rapidly growing STEM (science, technology, engineering, and math) movement in the **Indian River School District**.

What started five years ago as a small project at a few schools to bring more STEM-related opportunities to students, has blossomed into a multitude of opportunities across the district.

“My favorite part is the coding part. That’s the whole reason I’ve done it during the school year because I wanted to be able to code my robot,” **Lord Baltimore Elementary** fourth-grader Ruby DiSabatino said. “I’m going to be able to start to drive more. I’m actually getting really good at it.”

“When I get older, one of the things I want to do is be a mixture of a scientist and inventor because I make stuff at home out of random things I can find. Mom doesn’t like it, but it’s something fun for me to do when I’m bored,” Ruby said. “I want to do stuff like that when I’m older, and I think robotics will help me with that.”

What is remarkable is that the movement is united but looks a little different in each of Indian River’s schools, said Michael League and Melissa Bleile, instructional technology specialists.

STEM began for the Indian River School District with the adoption of the Project Lead the Way curriculum at **Selbyville Middle School** and **Indian River High School**.

“The engagement of the staff and students around the topics of design, engineering, coding, and robotics really prompted many schools to start looking at ways to bring these opportunities to more students at more schools,” League said. “Early on, we realized that this would not look the same at each of our schools.”

As a result of this philosophy, staff and students largely decide what STEM looks like at their school, with some support from district resources and other schools. Indian River has since adopted Project Lead the Way into two of its elementary schools, **John M. Clayton** and **North Georgetown**. A variety of other informal clubs and opportunities have begun across many Indian River schools.

Coding

Beginning in kindergarten, students at Indian River explore and learn coding during the Hour of Code. The Hour of Code is celebrated throughout Delaware in November and December. Students are encouraged to take coding to the next level through the use of Wonder Robotics, which includes the option to program robots using the Wonder Blockly coding app on iPad.

“When a child can code and program the robots to complete a task right before their very eyes it truly makes coding come alive,” Bleile said.

In middle school, students use free computer science curriculum resources from code.org to explore deeper coding experiences. By high school, Indian River students who have developed an interest in coding have the opportunity to choose computer science pathways or complete personalized code.org courses to continue to develop their coding skills.

Robotics

Indian River offers robotics in the district’s gifted and talented excel program and in Project Lead the Way schools. Additionally, six elementary schools in the district have launched robotics clubs using

the Vex IQ platform. Teams from each school collaborate to build and program a robot to complete tasks in a 4-by-8-foot Vex IQ playing field to test students' skills in designing, programming, driving, and building.

Lord Baltimore Elementary recently hosted a district Vex IQ Robotics kick-off. District teams and families came together to explore robotics and build with teams from other schools. Lord Baltimore Assistant Principal Travis Bower has coached district teams to the world competition.

"The best robotics teams in the state are in this district," Bower said. "Very good STEM teachers are in the district, and I know we're going to become a powerhouse.

Indian River will be hosting SuperBot Saturday VEX IQ Tournament at **Georgetown Elementary** on **Saturday, Feb. 17**. Vex IQ tournaments require teams to score points individually and by partnering with others, and students will have the opportunity to qualify for the state tournament.

MakerSpaces

At **Sussex Central High School**'s Science, Technology, Engineering, Art and Mathematics (STEAM) Lab, an after-school "Maker" group explores collaborations between different academic departments and student organizations to promote STEM-related projects that benefit all students.

"Students have the opportunity, time, space and materials to complete small projects in which they have interest," said Indian River teacher Britta Cordrey.

The group began meeting with a small team of teachers once a week after school and has converted an old photography darkroom into a MakerSpace with four 3D printers.

"This collaborative environment, where solutions are thought of together and knowledge is willingly shared among equals, is helping students prepare to work in similar STEAM industry environments," Cordrey said.

Students explore design challenges such as coding with a Raspberry Pi, space-themed spray paint art, and a mixed media project for the school library.

"The real world is messy; problems there don't always have simple answers or solutions," said the group's teacher advisor, Jeff Kilner. "STEAM Lab advisors and students have organized and facilitated multiple STEAM Lab challenge sessions where students practice design thinking and problem solving based on authentic problems."

Student Elias Timmons agrees. "The STEAM Lab allows students to design, build, and solve problems that help the community. It has helped me learn about important, real-world technologies and how they can be used in the future," Timmons said.

Upcoming projects include working on a drone quadcopter in partnership with the audio-visual department as well as creating an automated, small-plot agriculture robot with the Agriscience Department.

“Students must troubleshoot and debug things that don't quite work,” Kilner said. “Students create estimates and track spending against the budgets for their projects. If there is any impact that this club is making, it is in sharing essential skills of college and career readiness: collaboration, communication, flexibility and resilience.”