

VEX Robotics

VEX EXP robots give students hands-on experience with coding, using block code or programming languages like Python, and C++. These robots are not just for the classroom—they're also being used in extracurricular programs to deepen learning.



In Matt Fox's Grade 9 Technological Education class at Bayridge Secondary School, students are applying their learning about the Engineering Design Process (EDP) using the VEX robotics kits.

Students are given an engineering challenge that they need to work together to solve, using the EDP. They are then encouraged to reflect on their learning and next steps at the end of the activity.



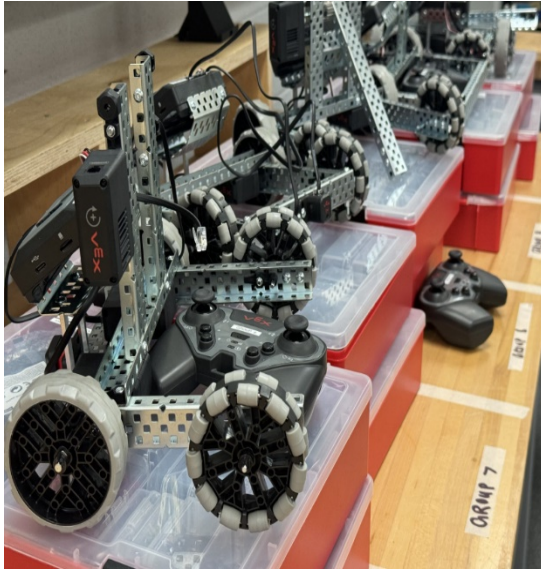
Figure 1: Engineering Design Process
(Ontario Technology and the Skilled Trades
Curriculum, 2024)

VEX robotics not only enhances student learning in coding and technology, but also fosters the development of important transferable skills like:

- Collaboration
- Problem Solving
- Communication
- Critical Thinking
- Digital Literacy
- Global Citizenship and Sustainability
- Innovation, Creativity, and Entrepreneurship

“Putting together the robot itself was frustrating sometimes, but it was a good group learning experience. It was fun building with a team also.”

- Grade 9 student at Bayridge Secondary School



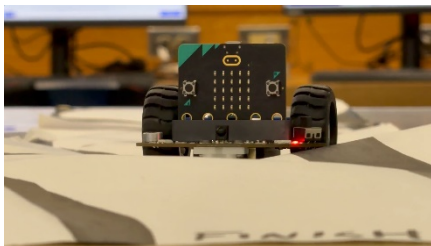
“In our TAS10 class, we're talking about a design process all the way through. How are we defining problems? How are we planning our solutions? And then what are we actually doing to build solutions to those problems with the robotics kits?

Every student has the same access to those tools within their [VEX robotics] kits. On an average day, I give them a problem, they have their periods, they have everything they need, and everything is tangible and immediate. They get to see that design process throughout the periods all in one.”

- *Technology and the Skilled Trades* educator at Bayridge Secondary School

Micro:Bits and Climate Action Kits

The BBC Micro:Bit is a versatile physical computing tool that enables students to design innovative solutions to real-world applications, linking to the United Nations Sustainable Development Goals, using sensors and other components. The Micro:Bit can be coded using Python, JavaScript, or block coding, which makes it an excellent tool for scaffolding student learning from block coding to text-based programming languages.



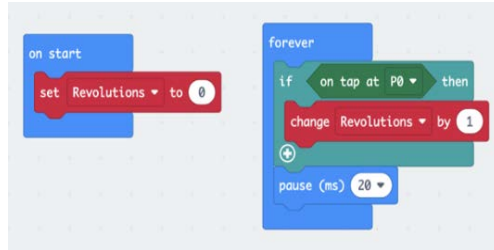
“Building these robots involves a lot of teamwork and collaboration, and you need those in a lot of places. Teamwork just to come up with ideas and share them with a group and see what they think of it, and then collaborate and build on that.”

- Grade 9 student at Kingston Secondary School

Connections are made between different subject areas, including literacy, as students reflect on and communicate the challenges they faced and the strategies they used while creating their designs. By introducing Micro:Bits into the classroom, we are equipping students to become innovators and providing them with the skills necessary to pursue future careers in an increasingly technology-driven society.

Students are using the Micro:Bits in conjunction with the Climate Action Kits to solve sustainability focused engineering challenges that align with the United Nations Sustainable Development goals.

As pictured below, students created windmills and then coded the Micro:Bit to count the number of revolutions of the windmill, as well as an estimate of the energy produced. This is an example of how the Micro:Bit provides learning experiences that have curricular connections beyond technological education to other subject areas, including science, math, and geography.



Examples of block and JavaScript programs that students wrote for their Micro:Bit using MakeCode.

“These STEM kits have been a game-changer in our classrooms. They allow students to get hands-on experience with the kind of technology they’ll encounter in the real world.”

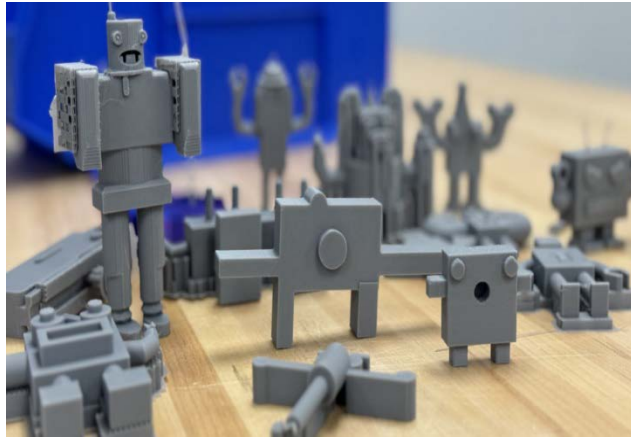
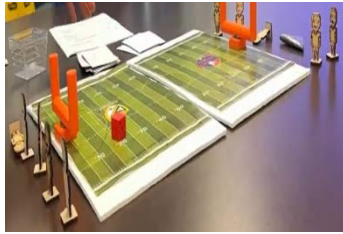
- Grade 9 educator at Bayridge Secondary School

“Everything has computer science now. We live in a time that everything involves computers. I think that having this experience would be really helpful to know what I want to do. I think it might be good for like my employer to know that I can do that.”

- Grade 9 student at Bayridge Secondary School

3D Printers

Limestone secondary students are using 3D printers in creative ways to enhance their learning across various subjects, from *Technology and the Skilled Trades* to *Communications Technology*. At Kingston Secondary School, students are designing practical items like cell phone protector cases and creating their own movie characters. Meanwhile at Bayridge Secondary School, students developed their own board game concepts and used the 3D printers to print the game board and pieces.



“It was very exciting to use the 3D printers. We used 3D modelling software called TinkerCAD to design our own product, like a cell phone holder. It was fun to create something that we could actually use!”

– Grade 9 student at Kingston Secondary School