

Over the course of five weeks and ten virtual activities, eight Mountain Lakes High School students mentored twelve students in rising grades 2nd - 4th, in programming, robotics, and creativity with the Micro:Bit and MakeCode platform. The Micro:Bit is an inexpensive, credit card size robot which has LEDs and sensors.

The Micro:Bit project was created by the Mountain Lakes Public Library Makerspace Manager Ian Matty in collaboration with Mountain Lakes High School student Jamie Barnett. The Micro:Bit project provides an opportunity for younger students to learn about the creative power of programming, robotics, and creativity, while High School mentors share their interests in computer science.

The primary goals of each activity were to introduce students to one new computer science concept and provide opportunities to make students confident and independent with the Micro:Bit. There were no project prerequisites. Each mentor - student group started with a simple "Hello World" program. From there, each activity was tailored to student interest and programming level; including music, games, animation, math, and magnetism!

During Parents Night Jamie Barnett led parents through programming a *Rock, Paper, Scissors* game; demonstrating how project mentors scaffold learning for kids by exploring simple button controls, if / then statements, variables, indexing, or arrays to create the same game; just using different levels of computer science skills and concepts.

Students zoomed through their activities and explored their Micro:Bit's creative capabilities with their mentors. Student engagement was fantastic. Pixel games were very popular. Students created yoga - balancing games using the Micro:Bit's accelerometer, flappy bird, and different versions of animated catch the dot games.

One of the project highlights occurred during the very last minute of the last activity; a student asked their mentor if they could add one more 'string' [words!]. The student wanted to add "**Thank You**"! That is how we measure the project's success!

The Micro:Bit project was a valuable learning experience for High School mentors too. High School mentors had a project summary meeting with Katie Henry, Head of Micro:Bit North America Partner Engagement, exchanging ideas about computer science education, robotics, and creativity. Mentors were impressed with their elementary school aged students ability to process and understand computer science logic. Mentor Jeffrey Zhang said "it was impressive how quickly students learned variables and were able to use them independently in their program", noting that variables are not usually taught until Algebra I in school. Mentor Arunima Paul learned about programming in Middle School and was happily surprised by student abilities to learn the Micro:Bit and enthusiastically create programs.

The Micro:Bit project received many positive comments from parents. One parent said, "*Prior to parents' night, I had no idea why my son kept saying "I need an if-then statement" when negotiating with me as to when he could have ice cream, play nintendo, etc. But I was even more blown away when, upon hearing that we made a rock-paper-scissors program during parents' night, he said "Oh! You must have needed three variables." I almost passed out. This was nothing short of an amazing activity for these kids, and it's a perfect foundation for future programming classes. Well done!*"

Additionally, another parent was excited that their child was now teaching their younger sister about the Micro:Bit!

Ian Matty and Jamie Barnett plan on expanding the Micro:Bit project in the Fall. Additionally, Jamie Barnett is a 2020 Aspirations NCWIT award winner and has an opportunity to earn a grant to design a computer science program for girls with the Micro:Bit.

The Micro:Bit project was free for all students and made possible by the commitment of Jennifer Lynch, Director of the Mountain Lakes Public Library to expanding digital literacies, Jamie Barnett's focus on providing tactile programming opportunities, and our thoughtful, energetic, and amazing Mountain Lakes High School mentors; Jackie Edwards, Arunima Paul, Shobika Prabhu, Monalisa Hait, Jeffrey Zhang, Maxwell Lin, and Conrad Lewis. If you would like to learn more about our expanding Micro:Bit projects or have interest in supporting them, please contact Ian Matty at LakerMakersClub@gmail.com