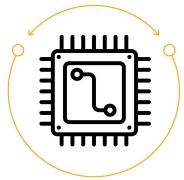




# SCALE K-12

## SCalable Asymmetric Lifecycle Engagement

### OUR HIGHLIGHTS



#### SCALE K-12 IMPLEMENTATION

##### BEGINS!

Three SCALE K-12 units implemented at Jefferson High School

#### WHAT IS SCALE K-12 VERTICAL ALIGNMENT?

How SCALE K-12 schools are making sure every child learns about ME

#### SCALE K-12 TEACHER HIGHLIGHTS

Meet 3 Indiana teachers who are bringing microelectronics to the classroom

### SCALE K-12 LEADERSHIP TEAM

Tamara Moore, PhD.  
*Program Director*

Selcen Guzey, PhD.  
*Professional Development Lead*

Morgan Hynes, PhD.  
*Summer Programs Lead*

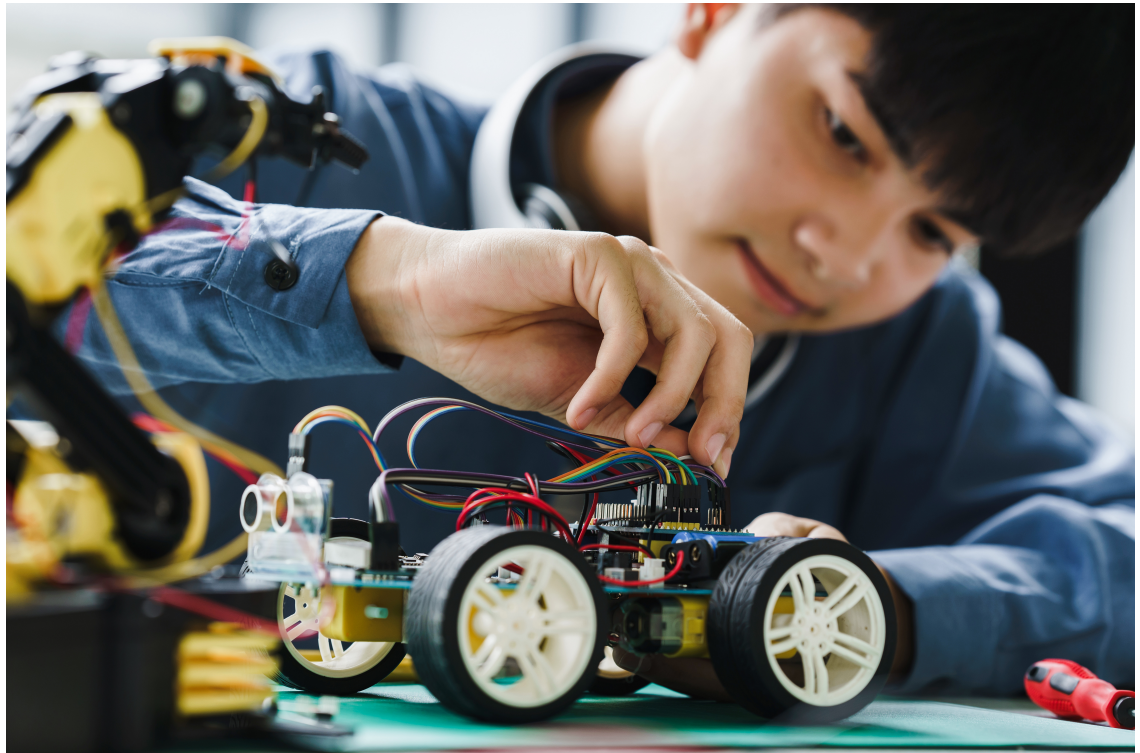
Kerrie Douglas, PhD.  
*Assessment Lead*

Anne Ottenbreit-Leftwich, PhD.  
*Coaching Lead*

Michi McClaine, M.S.Ed  
*Vertical Alignment Lead*

Mary Pilotte, MBA, PhD.  
*Curriculum Specialist and Industry Liaison*

Rena Sterrett, M.Ed.  
*Senior Project Manager*



# SCALE K-12 Implementation Begins!

## IMPLEMENTATION IN THREE CLASSROOMS AT LAFAYETTE JEFFERSON HIGH SCHOOL

Two integrated microelectronics units were implemented in SCALE K-12 classrooms in September and October. These units were designed by teams of practicing teachers, or Teacher Fellows, as part of the SCALE K-12 project.

Teacher Fellows worked closely with university researchers and graduate research assistants as they drafted an outline of a microelectronics unit that would meet learning objectives within the classroom and Indiana state standards. Graduate research assistants consulted with Teacher Fellows on their ideas and helped to write the units. Needed revisions were made before three Teacher Fellows implemented the curriculum units with their own students. All lessons were recorded and classroom artifacts collected for analysis of both content and pedagogy.

Melissa Colonis and Kaitlyn Myers, teachers at Jefferson High School, implemented a unit called *Stressed Out!* Within this engineering design unit, students designed ways to monitor stress during self-scheduled activities. Students learned about critical point, min/max behavior, intercepts, and continuity in the context of heart rates.

By using graphical knowledge, students made decisions about their model and presented their solutions. Rocky Alderman and Jayden Barley, both algebra teachers from Washington High School, will be implementing this unit during the second semester of this school year.

October was the starting month for Brian Bettag's microelectronics unit titled *Let the Good Ideas Roll!* Brian teaches Engineering and Technology Education at Jefferson High School. In this electronics-focused engineering design unit, students are challenged to create an electronic expansion pack for the Sphero BOLT, a small coding robot. Student's designs must consider the environmental impact of their proposed prototype as well as the criteria and constraints from the client. Throughout the unit, students will explore how electricity works, power, green energy, programming, and material sourcing. Students will drive and code the Sphero and investigate the Sphero's built-in microelectronics capabilities such as sensing, motors, and LEDs. Ricci Barber and Justin Resler, both Engineering Technology teachers with Tippecanoe School Corporation will be implementing this unit later in the school year.

## WHAT IS SCALE K-12 VERTICAL ALIGNMENT?

### WHAT DOES IT MEAN AND WHO DOES IT INVOLVE?

The SCALE K-12 project includes a vertical alignment component that will be designed with the help of Regional Opportunity Initiatives (ROI), located in Bloomington, IN. This vertical alignment component will help school districts to integrate microelectronics content into all grade levels. Vertical alignment is driven by what a school district wants students to know as they move through each grade. Concepts in microelectronics will be linked from grade to grade to create a long-term plan for teaching. Vertical alignment helps to provide the framework for learning and teaching skills and knowledge.

Vertical alignment in SCALE K-12 schools will help to build a microelectronics curriculum that prepares students for the next grade or level.

ROI kicked-off the SCALE K-12 vertical alignment work with district vertical alignment teams in October. ROI will also facilitate a full-day workshop for district vertical alignment teams in December. At the December workshop, ROI will provide district vertical alignment teams with a process and a framework to begin vertically aligning current district initiatives and in-development microelectronics curriculum units as well as begin to consider where further exposure and integration of microelectronics is needed across the district. District vertical alignment teams will meet with the ROI team monthly during the spring semester to further develop and refine each section of the vertical alignment documents, working from high school to elementary school.

# SCALE K-12 TEACHER HIGHLIGHTS

## KRISTEN VAN LAERE



Kristen has been in education for the past 16 years. Previously she worked for 10 years at Purdue University in various IT roles. She then made a career change, and landed at Lafayette Jefferson High School where she has been for the past 6 years. Kristen has many different roles at the high school, with one being teaching Information Technology (IT) classes for dual credit through a local community college. Kristen plans to implement all of the microelectronics lessons developed this summer in her IT classes.

Additionally, Kristen is a staff member of the Lafayette School Corporation Integrations Team in the IT department. After school Kristen can be found coaching the Unified Bocce Ball team, overseeing the Esports program, and mentoring the Best Buddies chapter.

Technology is a large part of Kristen's life, as she teaches it, uses it, and relies on it. The SCALE K-12 project

opened her eyes to the importance of manufacturing microchips in the U.S. She feels that microchip manufacturing will offer job opportunities for many of her students. These jobs will provide great benefits with continual learning on cutting edge technology. While serving on the project team, Kristen became aware of the security risks associated with using foreign microchips. She realized the importance of making microchips in the U.S., as many of the things we rely on, such as the electrical grid, needs to be secure. Kristen believes that we are very fortunate to be able to bring manufacturing of microchips back to the United States. She is excited about Skywater opening their microchip plant in the future and the impact of having microchips made in her area. ///

## BRIAN BETTAG



Brian teaches Engineering and Technology Education at Jefferson High School in Lafayette and has been teaching in the Lafayette School Corporation for the past 23 years.

In Brian's transportation course, students learn how to fly planes, make fiberglass boat hulls, and work on small gas engines. In his senior engineering course, students work through the design process by researching a problem, brainstorming and designing a solution, and implementing the solution before presenting their work to a team of engineers. Brian's introductory course helps prepare young students to progress through the various pathways in their department.

Brian is participating in SCALE K-12 because he recognizes the impact he can have in better preparing his students, and others within his department, for new Indiana workforce opportunities in the microelectronics industry. Brian is implementing his newly-created microelectronics unit with his introductory classes. This will enable students to build a foundation on which they can take additional courses at the high school level and beyond. By doing this, Brian feels he can best prepare his students for careers in microelectronics, if it's the path they choose.

In his free time, Brian stays physically active by playing basketball, cycling, and doing anything else that allows him to move around outside. He also enjoys reading about current events and technology developments, as bringing real world examples into his classroom is a large part of his teaching style. ///

## TRACIE MCATEE



Tracie teaches Algebra I, Project Lead the Way (PLTW) Computer Science I, II, and III, and PLTW App Creators at Loogootee Community Schools in Loogootee, Indiana.

She is involved in the SCALE K-12 project because she wants to be a part of the process that will bring more opportunities to the students at Loogootee Community Schools.

The Naval Surface Warfare Center, Crane Division (NSWC Crane) and WestGate@Crane Technology Park play a huge role in the small community of Loogootee and Tracie wants to do whatever she can to boost the presence of microelectronics and technology in general in her curriculum.

The microelectronics curriculum Tracie helped to design is based on programming sensors to function together as a unit to create a smart home. ///

FOR MORE INFORMATION ABOUT SCALE K-12, CONTACT: