SCALE K-12

SCalable Asymmetric Lifecycle Engagement

OUR HIGHLIGHTS

WHAT IS SCALE K-12?

Teaching K-12 students about microelectronics and their applications in the real world

SCALE K-12 PROFESSIONAL DEVELOPMENT '23

One-week sessions for educators held in June and July at Purdue University

SCALE K-12 SUMMER CAMPS

Over 200 students participate in SCALE K-12 summer camps

SCALE K-12 TEACHER HIGHLIGHTS

Meet 4 Indiana teachers who are bringing microelectronics into the classroom

SCALE K-12 LEADERSHIP TEAM

Tamara Moore, PhD.
Program Director

Selcen Guzey, PhD.
Professional Development Lead

Morgan Hynes, PhD.
Summer Programs Lead

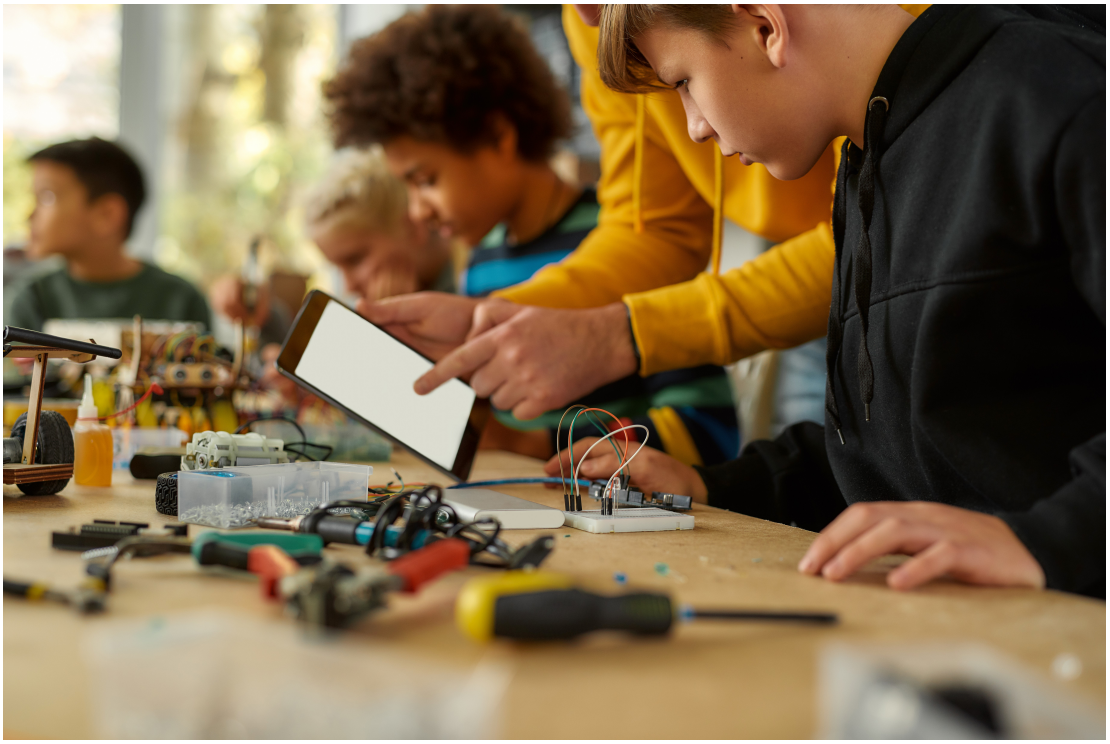
Kerrie Douglas, PhD.
Assessment Lead

Anne Ottenbreit - Leftwich, PhD.
Coaching and Vertical Alignment Co-Lead

Michi McClaine, M.S.Ed
Coaching and Vertical Alignment Co-Lead

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

Rena Sterrett, M.Ed.
Senior Project Manager



SCHOOL OF EDUCATION
ROI REGIONAL OPPORTUNITY INITIATIVES
PURDUE UNIVERSITY
INSPIRE Research Institute for Pre-College Engineering

WHAT IS SCALE K-12?

TEACHING STUDENTS ABOUT MICROELECTRONICS AND THEIR APPLICATIONS IN THE REAL WORLD

SCALE K-12 is an engineering, design-based approach to teacher professional development that helps teachers design curricular modules and activities for microelectronics (ME) within the Indiana State Academic Standards.

It aims to expose, motivate, and ultimately prepare students from diverse backgrounds with the skill set and mindset for careers in defense-related ME.

This summer thirty-six teacher Fellows participated in one week of summer professional development at Purdue University. These teachers also agreed to participate in up to 6 additional 2-hour online professional development opportunities throughout the 2023-2024 school year.

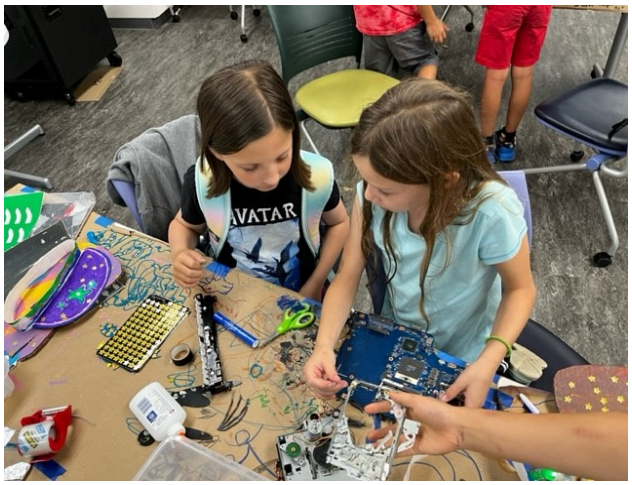
As part of SCALE K-12, Fellows are participating in a researcher/teacher curriculum writing team and will develop one ME module and one ME shorter activity. Fellows will then implement the module and activity with their students during the 2023-2024 school year. SCALE K-12 also includes Fellow participation in curriculum writing and reflective team meetings with an assigned coach.

Participating school districts will also take part in the development of vertical alignment within their school district. As part of the vertical alignment process, district educators and administrators will serve as part of a vertical alignment and coaching team.

SCALE K-12 involves Purdue University's Colleges of Engineering, Education, and Science, Indiana University's Department of Instructional Systems Technology, and Regional Opportunities Initiatives.

Indiana school corporations participating in SCALE K-12 include Benton Community School Corporation, Greater Jasper Consolidated Schools, Lafayette School Corporation, Loogootee Community School Corporation, Tippecanoe School Corporation, Washington Catholic Schools, and Washington Community Schools.

Future planning for SCALE K-12 involves the creation of online professional development for each curricular unit or activity developed, to be used for broader impact.



"The big premise of this is to increase awareness of microelectronics and the hope would be that when we get through this grant that we will have some sort of articulation in K through 12 where all kids are going to be exposed to microelectronics on some level or some scale."

- Dr. Laurie Rinehart / LSC Assistant Superintendent for Secondary Curriculum & Instruction / Journal & Courier

SCALE K-12 PROFESSIONAL DEVELOPMENT '23

ONE-WEEK SESSIONS HELD IN JUNE AND JULY AT PURDUE UNIVERSITY

During the 2023-2024 school year, SCALE K-12 is partnering with 7 school districts across Indiana to expose, motivate, and ultimately prepare students from diverse backgrounds with the skill set and mindset for careers in defense-related microelectronics (ME).

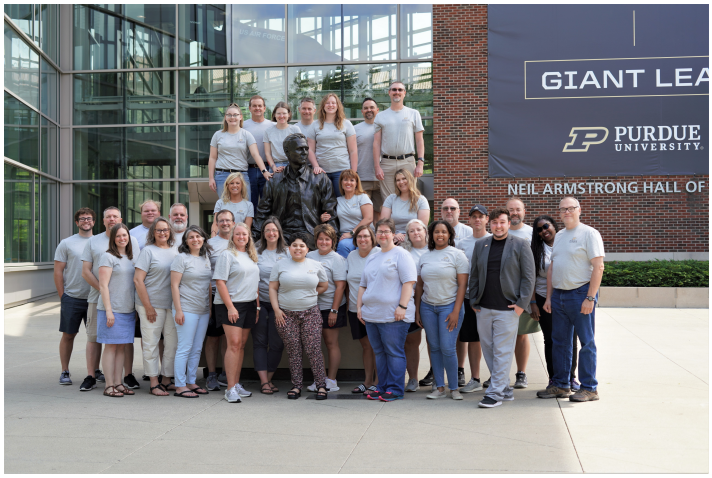
In June and July of 2023 thirty-six teachers from the Crane and Lafayette, Indiana areas attended one week of SCALE K-12 professional development held at Purdue University.

Dr. Tamara Moore, SCALE K-12 Program Director, led the team of faculty, staff, and graduate students as they guided high school and middle school teacher Fellows in the beginning design of an ME curricular module and activity focused on ME contexts and/or concepts.

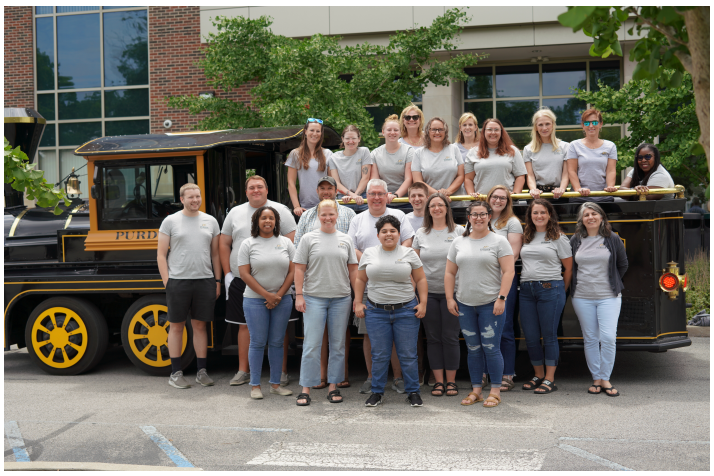
During the upcoming school year, each Fellow will also help design online professional development related to their curricular innovations.

Fellows learned more about microelectronics by touring Purdue's Nanotechnology Center and working through an example curriculum developed at Purdue. The pre-developed curriculum also helped Fellows to better understand the structure of an engineering design-based STEM integration unit.

July Fellows were also able to attend a Microelectronics Materials Fair held by STEM Education Works. This Fair introduced Fellows to ME materials that can be used in a classroom and offered a hands-on opportunity for deeper exploration of materials Fellows might wish to incorporate into their own curriculum.



SCALE K-12 Professional Development held in June



SCALE K-12 Professional Development held in July

"Loved the teamwork and new ideas." - PD Fellow

"The week was well organized and the expectations of the teachers were doable. I look forward to seeing our unit come to life!"

Quote by PD Fellow

SCALE K-12 SUMMER CAMPS

Summer camps held at Purdue University

Approximately 200 students participated in SCALE K-12 microelectronics camps held at Purdue University during June and July of 2023. The second week of PD for Fellows coincided with the Purdue INSPIRE camp for 8–10-year-olds. During the PD, students had the opportunity to show off their electronic hats/crowns, their micro bit-controlled infinity mirror, and micro bit electric guitar. Students explored the world of microelectronics from their creation to their creative disposal. During the week-long camp, students programmed micro bits to control lights for puppet shows, disassembled electronics to repurpose parts and pieces as works of art, and learned how to program microcontrollers. Purdue SCALE K-12 summer programming for children, led by Dr. Morgan Hynes, spanned three camps, over 6 weeks.

LSC Fellow, Melissa Colonis, interacts with children attending the SCALE K-12 summer camp.

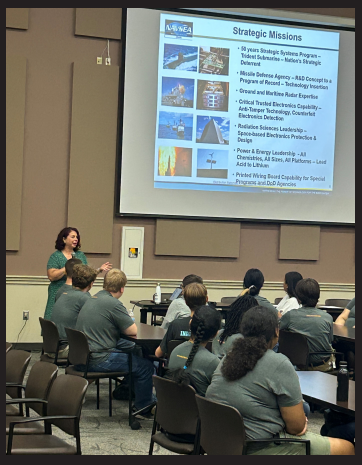
PURDUE UNIVERSITY | INSPIRE Research Institute for Pre-College Engineering

Summer camps held at NSWC Crane

NSWC Crane hosted 23 campers, aged 7-11 during their camp week held July 10-14. The camp theme was "The Art of Electronics", which was centered around learning about the micro bit. Campers were led by Tina Closser, NSWC Crane K-12 STEM Coordinator. Three NWSC interns also helped lead campers in activities as part of their capstone project. All three of the interns are interested in pursuing future careers in Engineering.

During the week of activities, a local educator joined the camp with two of her students. These students worked through the projects alongside campers. The educator was so impressed with the projects that she hopes to implement them in her classroom.

NSWC Crane intern helps a camper with an engineering activity.

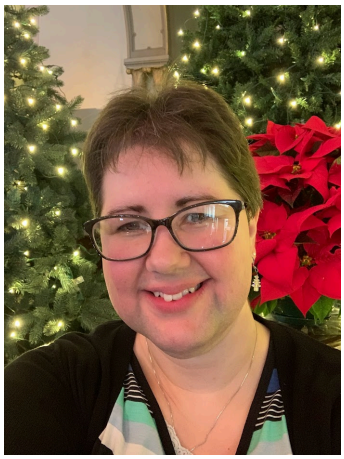


Tina Closser shares information about NSWC Crane with students.

NAVSEA WARFARE CENTERS CRANE

SCALE K-12 TEACHER HIGHLIGHTS

LAURA LITWILER



Laura is a high school mathematics and chemistry teacher at Washington Catholic Middle/High School in Washington, Indiana. She is also a 2008 graduate of the University of Southern Indiana.

Laura decided to be a part of SCALE K-12 not just to help her school system, but because she also wanted to learn more about microelectronics and how important they are in the technologies we use everyday.

Laura will be implementing a SCALE K-12 unit in her Algebra II classes this school year. ///

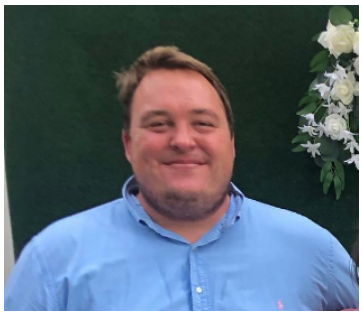
MELISSA COLONIS, PhD

Melissa teaches algebra, pre-calculus, calculus, and trigonometry at Jefferson High School in Lafayette, Indiana. The 2023-2024 school year is Melissa's 32nd year in education.

Melissa is involved in SCALE K-12 for two reasons. First, she says that any project that Dr. Tamara Moore is involved in is a quality project. She is also involved because she wants to make her students more aware of careers available in the area of microelectronics.

Melissa's SCALE K-12 topic area of implementation this school year includes personal health rate and stress management. ///

SHANE TURNIPSEED



Shane teaches business at Jefferson High School in Lafayette, Indiana. He also serves as an assistant football coach and boys head track coach at Lafayette Jeff.

Shane is involved with SCALE K-12 to help grow the employee base for Skywater, an upcoming semiconductor manufacturing facility coming to the Discovery Park District of Purdue University.

Shane's SCALE K-12 unit will be implemented in his Preparing for College and Careers class during this school year. ///

MELANIE GILBERT

Melanie is a business teacher at Jefferson High School in Lafayette, Indiana. She teaches dual credit courses including: Marketing Fundamentals, Principals of Business, and Management Fundamentals.

Melanie has worked in a variety of business roles in the Lafayette community and is a licensed Realtor with Berkshire Hathaway HomeServices. The SCALE K-12 project is very exciting to Melanie. She thinks expanding into microelectronics will be a great opportunity for the community and local economy, as well as a great experience for her students.

Melanie looks forward to implementing microelectronics in her Marketing Fundamentals class. ///

FOR MORE INFORMATION ABOUT SCALE K-12, CONTACT:

Rena Sterrett, SCALE K-12 Senior Project Manager at scale.k12@purdue.edu