

# blueprint for innovation

## Introducing: The New MERIT Program 2.0



The MERIT program launched with a new name this year: Making Education Relevant through Innovative Teaching. A total of 42 educators from all over the Bay Area, California, and beyond (coming from as far away as Hawaii and El Salvador) gathered together at KCI for a two week summer intensive in July. This marked the beginning of a 10-month professional learning journey, which will include four follow-up days spread throughout the school year, learning and sharing at professional development opportunities, and additional KCI classes. The plan is for educators to leave the program transformed—inspired to innovate their practice and connected to one another as part of a larger, supportive professional learning network.

Since educators are increasingly comfortable incorporating technology in the classrooms, MERIT 2019 focused on engaging student-centered pedagogy—with and without

technology. An all-star instructional team, which included Lisa DeLapo (MERIT Director), Brian Briggs (MERIT Assistant Director), Jonathan Almerido, Lisa Guardino, and Kas Pereira, led participants through a series of workshops featuring current best teaching practices. Topics included EduProtocols (student-centered, technology-infused routines), HyperDocs (digital lessons designed with links and tasks as well as opportunities for exploration, critical thinking, and creativity), visual thinking, video creation, and more.

By the end of the two weeks, participants created numerous learning artifacts for their digital portfolios including daily reflections, several short videos, and a lesson plan for implementation this fall. Each educator presented an outline of her/his lesson. Topics ranged from leading teachers through the engineering design process; using HyperDocs to teach ecosystems; teaching third graders

reflection strategies; assigning video essays around the theme of coming of age; having students design a “Great American Road Trip” using tech tools to review U.S. geography; and asking students to create Choose Your Own Adventure narrative stories using Google Slides. While the content and tech tools varied, all of these ideas were grounded in future-ready pedagogy with ample opportunities for students to exhibit voice and choice.

The MERIT 2019 cohort members were particularly impressive because of their standout enthusiasm, boundless energy, and how quickly they bonded and became a close-knit community. Many helped organize a series of social activities including a potluck lunch, a photo booth station up some of the days, plus numerous afternoon and evening activities such as visiting the Google sculpture garden and attending a baseball game. The group already has an active presence on social media. Be sure to follow the #MERIT19 hashtag to check them out.





# KCI Makerspace Coordinator Program a Hit

Over fifty people are on track to receive their Makerspace Coordinator Certificates after the KCI held three, week-long intensives this summer. The Certificate marks the completion of 18 units of coursework, and is one of only two in California that is state approved. Participants hailed from all over California and came from many diverse backgrounds, including education, engineering, art, and computer science. They joined one of KCI's two programs: Makerspace Coordinator or UniDiversity, a cohort consisting entirely of women of color and women veterans, sponsored by Cisco. The purpose of the certificate is to prepare people to lead and manage makerspaces, whether they are in schools, libraries or community centers.

During the programs, participants learned to use the key tools in the Makerspace, including laser cutters, vinyl cutters, CNC machines, and 3D Printers. In addition they learned how to use different design software in order to bring creations from a digital to a physical space. Students had

multiple opportunities to practice their skills through several design and engineering challenges to design, prototype, and revise their creations, emphasizing the processes of computational and design thinking. The instructors also spent time discussing important concepts of safety, fostering creativity through tinkering, structuring a makerspace, and developing resources and materials.

Participants reported that the program “opened up a new world of possibilities” for them, and that they “appreciated the design process and the role of play when learning and figuring out new tools.” Anonymous survey data indicates that 100% of participants felt the summer intensive increased their confidence with makerspace tools, both on their own and when using them with students.

The Summer Intensive portion of the program consisted of 10 units of hybrid courses. Students received hands-on, face-to-face instruction in Design Thinking, Adobe Illustrator, Block-Based Coding, and 3D Design, with online follow-up assignments to reinforce theories and provide opportunities for practice. After the intensive ended, participants returned to the Makerspace frequently throughout the summer to complete follow-up projects, practice with the machines, and develop materials that they could



use in their classrooms and workspaces. At the end of the summer quarter, students completed final projects, showcasing their design and prototyping skills. Projects included projection systems, interactive musical learning devices, hand-designed pop-up books, classroom space redesigns, and math manipulative kits.

The Makerspace Coordinator Certificate programs will continue in the fall and winter quarters, with follow-up days that introduce the final five courses for the certificate. Fall courses will focus on programming and robotics, while winter courses will dive deeper into design thinking and learning progressions. It will be exciting to see the amazing products that participants dream of and create before they graduate in March.



# KCI's NGSS Program Supports the New Standards for Science

Clunk! Swish! Tong... TONG! These are the sounds participants in the KCI NGSS Program hear as they bump ordinary clothes hangers, connected to short pieces of string, against different surfaces in the classroom. After two minutes of self-directed exploration, the students are “hooked” by this phenomenon! Questions begin to form: Why are the sounds so different? How does the sound move through the string? What will happen if we use plastic hangers?

The simple “Hanger and String” activity is the kind of experience that NGSS asks teachers to use in their classrooms. Rather than starting with a lecture on sound theory, NGSS challenges teachers to start with a real-world phenomenon. Once students are engaged, they can formulate questions and use authentic science and engineering practices to explore their questions and explain their findings.

KCI's NGSS Program inspires teachers to actively engage students in hands-on, inquiry-based science. The program immerses teachers in Next Generation Science Standards (NGSS) practice lessons, which embody the teaching strategies and science content required by the new standards. Teachers gain a deeper understanding of the NGSS, and leave this five-day program feeling better prepared to make the transition to the new standards.

The program focuses on three components of NGSS: Anchoring Phenomena; the Science and Engineering Practices (SEPs); and student-driven inquiry (5 Es: engage, explore, explain, elaborate, evaluate). During each day of the program, we engage teachers in real NGSS lessons. Each practice lesson connects a science and engineering practice to a step in the 5E process. To reach all teachers, we select practice lessons that span multiple grades. Similarly, we have chosen practice lessons that cover all four NGSS disciplines (life science, earth science, physical science, and engineering). Participants have time for “Reflection and Implementation,” allowing them to collaborate, find ways to apply what they have learned, and plan lessons to implement in their classrooms.

To measure impact, KCI surveys participants pre- and post-program. In the two summer programs, incoming participants arrived with little or no experience teaching NGSS. On a 1-5 scale, the latest cohort rated their overall knowledge of NGSS as 2.4 (not very familiar). After the program, respondents moved up 1.4 levels to “moderately familiar.” When reflecting on their understanding of the 5E instructional model, respondents moved up almost two levels, and they also moved up almost two levels in their

confidence applying the eight Science and Engineering Practices.

Teachers enjoyed the program, mentioning the welcoming atmosphere and freedom to ask questions, time to organize their thoughts and focus, and the many resources provided. One teacher commented, “I liked the hands-on projects—we got to be students and actually experience what they would do/feel/learn during a lesson.” Another stated, “I feel I can jump into NGSS this year. Before I was afraid of the complexity of the new standards. Now I feel ready to do it.” KCI's NGSS Program can jumpstart standard readiness in any school or district.

**Contact Liane Freeman at  
(650) 949-7180 for more info  
on KCI's NGSS Program.**



## NEXT GENERATION SCIENCE STANDARDS

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**BY CHECK:** Krause Center for Innovation, 12345 El Monte Rd., Los Altos Hills, CA 94022  
(Attention: Gay Krause, KCI Executive Director)



# KCI Conducts Three Summer Math Programs

KCI tripled down on math professional learning programs for educators this summer, with programs geared for 4<sup>th</sup>-5<sup>th</sup> grade teachers, 6<sup>th</sup>-10<sup>th</sup> grade teachers, and a new audience of preservice teachers, earning teaching credentials at San Jose State University.

First up, the EMPowered program took place July 12-19, led by experienced math teachers Cristina Bustamante (KCI's math programs director) and Sabrina McDaniel. This six-day, blended learning program focuses on providing 4<sup>th</sup>-5<sup>th</sup> grade teachers with deeper content knowledge of mathematics, as well as hands-on projects and tools to engage students in math learning. Most elementary teachers are not credentialed in math. EMPowered provides the support and resources they need, based on the Eight Mathematical Practices and computer and web technologies to engage and motivate learners. Teachers tackle algebraic reasoning, number concepts (including fractions), measurements and data, and introductory geometry concepts. One teacher stated, "I valued the ability to have open and honest discussions about math, and the limitless resources I now have at my fingertips to support my students." Another appreciated the hands-on activities and stated, "by struggling ourselves and realizing what we learned, it allows us to see math from our students' perspectives." Participants will be returning for four follow-up, day-long sessions during the school year and will complete in March.

Focused on 6<sup>th</sup>-10<sup>th</sup> grade math teachers, The Faculty Academy for Mathematics Excellence (FAME) occurred July 22-26. In its tenth year, FAME is designed to increase teacher content knowledge and teaching skills in key pre-algebra, algebra, and geometry concepts. Instructors Ed Campos and Cristina

Bustamante led the cohort through exploring ratios and proportional reasoning, expressions and equations, algebraic functions, and transformational geometry concepts that are the most difficult to teach and for students to learn. During the program, teachers are treated as students with a focus on patient problem solving. They then have in depth debriefs after activities to discuss the math learning and the pedagogy so they can integrate these activities into their own classrooms. One teacher noted, "I gained such a variety of lessons, resources, and technology tools that I can use with my students. I also value the connections made with my cohort and the instructors." Similar to EMPowered, the FAME cohort will attend four follow-up sessions during the year to share their experiences and tackle additional math topics.

KCI's third math summer institute was in partnership with San Jose State University and was geared to teacher

candidates working toward their credentials. Based on FAME, Ed Campos and Jeremiah Ruesch team taught the cohort over the course of a month with 32 hours of face-to-face instruction and 8 hours of online assignments. The program focused on creating an inquiry-based, student-centered math class, that engages students in the Eight Standards for Mathematical Practice. The program also promoted instructional technology to support student-centered teaching and learning. Topics covered included number sense, algebra, geometry, and stats/probability, which introduced participants to the Single Subject Math CSET Subtest I and II topics. The program was geared to credential candidates who want to become elementary school teachers, as well as those interested in teaching middle school math. Feedback on the program was positive, and KCI and SJSU are discussing plans to offer the program in summer of 2020.





# CS Programs Continue to Draw Educators

KCI recognized the need for computer science professional development programs over four years ago, even as schools and districts were still trying to determine how CS fits within their curriculum offerings. Last September, the State Board of Education adopted California's first-ever computer science standards. Although not mandatory, these standards are expected to increase the number of CS classes taught in California. Teachers are highly interested in CS professional learning, and the KCI Computer Crash Course for Educators has become one of KCI's most popular programs.

With funding from Microsoft, KCI offered two Crash Course programs this summer, and 50 teachers and educational coaches completed the programs. One of the main goals of the Crash Course is to show teachers that CS is more than coding. Topics covered during the program are broad based, including algorithms, data, internet and the impact of computing. The participants gain practice in computational thinking and the problem solving aspect of CS. Participants also learn to code, choosing either Scratch or Python to pursue for their projects.

Besides building confidence in the CS concepts and coding, the program models successful teaching practice since it is designed and taught by teachers who are active in middle and high school classrooms. The CS instructional team, led by Sheena Vaidyanathan, included Ann Greyson,

Ed Campos, Chris Bell and Jessica Hexel, all CS teachers in local and regional schools. One teacher commented, "The instructors were fantastic! All were extremely knowledgeable, approachable and supportive. They did a great job differentiating for all of the different learners in the class and modeled what adjusting instruction based on student needs looks like."

At the end of the programs, 100% of the participants stated they would

recommend the program. Feedback was positive as participants confirmed that the program met or exceeded their expectations. "I learned some great new applications of coding. I learned some basics of the internet which I didn't know. I definitely had my mind opened to the value of introducing/exposing students to computer science concepts which I may have not fully considered before," noted one of the participants.



## Register Online for KCI Classes

A variety of for-credit online, on-campus, and hybrid classes are offered each quarter. For best course selection register early since classes fill quickly. It's easy! Visit [krauseinnovationcenter.org/classes](https://krauseinnovationcenter.org/classes) to view and register for FASTtech classes.



# KCI Makerspace Offers Community Memberships



Come exercise your creative maker skills at the KCI Makerspace, a prototyping lab providing our community with the resources to design and make using a variety of computer-aided design and manufacturing tools. We serve a range of constituents: Foothill-De Anza District students and staff, local area educators and the broader San Mateo and Santa Clara counties. We provide not only the tools but the courses, certification, events and social support to get you making.

Join now and get started with the required orientation and training to use the various tools. Once trained, members can use the shop's machines, including laser cutters, 3D printers, sewing machines, vinyl cutters, soldering irons, hand and power tools, and much more. Membership includes introductory training on all equipment.

To learn more go to:  
<https://krauseinnovationcenter.org/makerspace-2/makerspacemembership/>



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