The 4th Annual C-STEM Symposium

Engaging and Empowering
All Students to Excel in Math and CS

UCDAVIS
C–STEM Center

REDLANDS EXCELLENCE IN EDUCATION UNIFIED SCHOOL DISTRICT

March 14, 2023

Redlands, California

Message from the C-STEM Center Director

Dear C-STEM Symposium Attendees,

We are very pleased to welcome you to the 4th Annual C-STEM Symposium on Integrated Computing and STEM Education, co-organized by the UC Davis C-STEM Center and the Redlands Unified School District.

This one-day event is designed to inspire educators across California, especially those from Southern California, with hands-on sessions and conversations about transforming math, CS, and CTE education with coding and robotics. The theme of the Symposium is "**Engaging and Empowering All Students to Excel in Math and CS**."

We are honored to have Mary Nicely, Chief Deputy Superintendent of the California Department of Education, as the keynote speaker. Nicely has extensive experience as an advisor to State Superintendent of California Department of Education's Tony Thurmond, leading efforts focused on recruiting and retaining teachers of color, community schools, and educator housing. She has also been involved in public/private partnerships with philanthropy and industry. Nicely brings a wealth of knowledge to our event, and we look forward to hearing from her. Our moderator for this session will be Dr. Barbara Nemko, Superintendent of Schools, Napa County, who has such valuable experience and expertise to contribute. We are grateful to have her as part of this event.

For our Plenary session, we have experienced C-STEM Superintendents Mauricio Arellano from Redlands Unified School District, and Dr. Alfonso Jiménez from Hacienda La Puente Unified School District, along with Deepika Srivastava, STEAM & Innovation Coordinator from Redlands USD, and Patricia Elder, Teacher from Hacienda La Puente USD, as well as students from both districts.

RoboPlay Competition returns as a Mini RoboPlay showcase for six teams of elementary students to demonstrate math problem-solving skills, creativity and teamwork as they tackle exciting challenges. Don't miss the chance to see the Mini RoboPlay exhibition and learn how to organize your own local competition in your school or district!

The breakout sessions are designed to provide valuable insights and practical strategies to integrate math with coding and robotics for everyone, from administrators to teachers, counselors, and TOSAs, ensuring that there's something for everyone to learn and take away from the event.

We extend our sincerest gratitude to all the moderators, presenters and facilitators for their hard work and invaluable contributions toward making this symposium a success for all participants. We recognize that this event wouldn't have been possible without your insights and expertise. Thank you for sharing your time, knowledge and passion with all of us.

We warmly invite you to experience the exciting and innovative C-STEM program that engages students with an interdisciplinary curriculum integrating math, coding and robotics. Together, we will continue to work toward bringing hands-on coding and robotics to K-12 classrooms and to closing the math achievement gap

Sincerely,
Harry H. Cheng
Professor and C-STEM Center Director

C-STEM

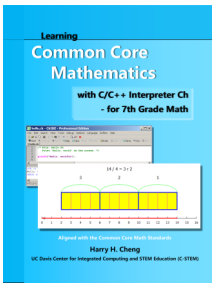
Learning Math with Coding and Robotics

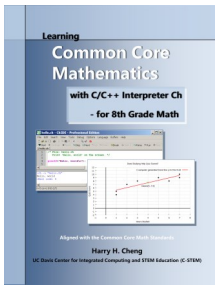
C-STEM Math-ICT Curriculum

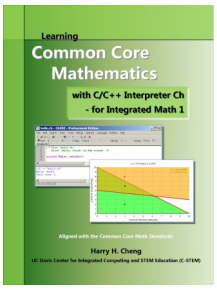
c-stem.ucdavis.edu/curriculum

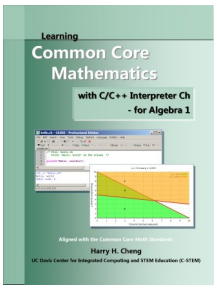
C-STEM (Computing, Science, Technology, Engineering, and Mathematics) is a UC Approved Educational Preparation Program for Undergraduate Admission for both K-12 and Community College students to all UC campuses. The A-G approved C-STEM courses at the UCOP web site can readily be added in a high school's A-G course list. C-STEM Math-ICT Curriculum provides students with 13 years of experience learning math with coding and robotics. Integrating coding and robotics into math education facilitates an engaging, rigorous course that promotes critical thinking and creative problem solving. Many students who take C-STEM Math with Coding and Robotics courses have fun learning without associating the course with their struggles in a traditional math class. This unique hands-on approach provides students with the application-based learning they need to gain a thorough understanding of the materials.

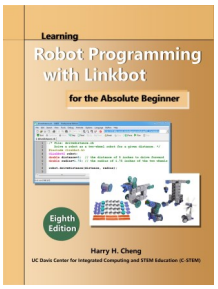
Selected Samples of C-STEM Textbooks and Curricula

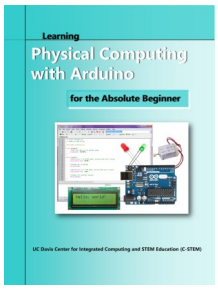












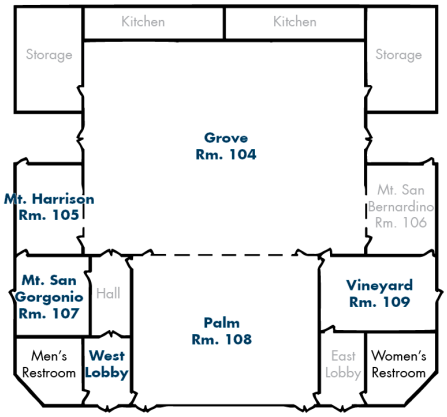
RoboPlay for Engagement and Project-Based Learning

http://c-stem.ucdavis.edu/roboplay

RoboPlay Competitions are theme-based level playing field robotics competitions for students in grades 5-12. The competitions are designed to engage students in project-based team activities and allow them to showcase their accomplishments and creativity. The competition arena and specific challenges are unknown to participants until the day of the competition. Using their math, programming, and problem solving skills, student teams try to most efficiently obtain the highest score for each task on their own. Schools and districts can host their own competitions using C-STEM resources.

Information

Orton Center



Location: Orton Center, University of Redlands, Redlands, CA

Hosted by: Redlands Unified School District

WiFi
username: C-Stem
password: RUSD2023!!

Download software here:

roboblocky.com/download/

Keynote Speaker

Engaging and Empowering All Students to Excel in Math and CS

Mary Nicely
Chief Deputy Superintendent, California Department of Education

Mary Nicely is Chief Deputy Superintendent of the California Department of Education (CDE). Nicely previously served as Deputy Superintendent for the Information and Technology Branch and Senior Advisor to Thurmond, where she led the Superintendent's Initiatives Office and focused on recruitment and retention of teachers of color, community schools, and educator housing and public/private partnerships with philanthropy and industry.

Before joining the CDE, Nicely served as Chief of Staff and District Director to then-Assembly Member Thurmond, representing California's 15th Assembly District.

Prior to her legislative career, she was President and CEO of Nicely Done Solutions, Inc. a custom database development company headquartered in Berkeley, California founded in 1994. She also served as the Western US K–12 Service and Support Manager for seven of her 13 years at Apple.

Nicely is a first generation Burmese American and holds a bachelor's degree in political economy of industrial societies from the University of California, Berkeley, and a business administration degree from Monterey Peninsula Community College in Monterey.

Moderator

Engaging and Empowering All Students to Excel in Math and CS

Dr. Barbara Nemko
Superintendent of Schools, Napa County Office of Education

Selected by the Center for Digital Education as one of the "Top 40 Innovators in Education", Dr. Nemko describes herself as passionate about ed tech, even though she bravely admits to sometimes struggling with her own technology devices. She is a strong advocate of curriculum materials with embedded media that engages and motivates learners and content that can be instantly updated.

Two "ed tech" programs of which Dr. Nemko is particularly proud are the "Footsteps2Brilliance" early learning for preschoolers (especially helpful for ESL learners and their parents) and tech tutoring where Court and Community School students teach residents of the Senior Center how to use their mobile devices.

Working in education her entire life, Dr. Nemko started as a teacher in New York City, then took a position at U.C. Davis evaluating California Department of Education programs. Later, when Dr. Nemko was Curriculum Director at Napa County Office of Education, she was appointed Interim Superintendent when the Superintendent retired. Now in her sixth elected term, Dr. Nemko continues to use her ed tech enthusiasm to promote positive programs for over 21,000 students at five districts within Napa

Plenary Speakers

Dr. Mauricio Arellano

Superintendent, Redlands Unified School District

Mr. Arellano was appointed Superintendent of the Redlands Unified School District in September of 2017 after an extensive national search. Prior to his arrival to the Redlands Unified School District, Mr. Arellano served as the Assistant Superintendent, Human Resources for the Palm Springs Unified School District for fourteen years. Previous to his assignment in Palm Springs, he served for twelve years as the Certificated Director of Personnel, Elementary Principal, Elementary Vice-Principal and Elementary Teacher for the San Bernardino City Unified School District. Mr. Arellano is a long-time member of the Association of California School Administrators (ACSA), the California Association of Bilingual Educators (CABE), the School Superintendents Association (AASA), the Association for Employment in Education (AAEE) and the American Association of School Personnel Administrators (AASPA).

Dr. Alfonso Jimenez

Superintendent, Hacienda La Puente Unified School District

Dr. Alfonso Jiménez has served as Superintendent of the Hacienda La Puente USD since July 2020. The District serves 16,172 TK-12 and 12,000 adult education learners. Dr. Jiménez has 26 years of experience with 19 years in administration serving as assistant principal, principal, director, assistant superintendent, deputy superintendent, and now superintendent. Through his leadership, various programs continue to thrive such as C-STEM, New Pedagogies for Deep Learning (NPDL), visual & performing arts, robotics, and dual immersion. Under his leadership, two schools recently were awarded Schools to Watch at the state and national level. Several schools also earned honors for incorporating civic education. Dr. Jiménez holds a B.S in Physiology

Deepika Srivastava

STEAM and Innovation Coordinator, Redlands Unified School District

Deepika is the STEAM & Innovation Coordinator at Redlands Unified School District in California. Srivastava is well known for conceptualizing, planning, and coordinating K-12 STEM programs/pathways in collaboration with community partners to ensure student achievement for the entire spectrum of student needs and strengths to close the opportunity gap for historically underrepresented minorities, with a special focus on girls, Multi-language learners, and students with disabilities. She has presented at various state (CA STEAM Symposium, CASE), national (CUE, NCTM, MITScratch) and international level conferences(ISTE2020, ISTE 2022). In 2020, she received the C-STEM Administrator of the Year and is the recipient of ISTE certificate for Artificial Intelligence Explorations in 2021. She has a Master of Science degree in Physics, Computer Applications and Educational Administration, a Single Subject Teaching Credential in Math, Physics, Chemistry, Introductory Science, administrative credential and over 16 years of professional experience as an educator in the United States and India. experience as an educator in the United States and India.

Patricia Elder

Teacher, Los Altos Elementary

Ms. Patricia Elder is a passionate third grade teacher at Los Altos Elementary. She has worked as a site leader, not only in CSTEM, but also in New Pedagogies for Deeper Learning (NPDL), and Teaching English Language Through the Arts (TELA), She is currently in her 28th year teaching and is participating in the HLPUSD UC Davis cohort to obtain her CSTEM certification. She is also proud to work in the same district where she attended school. When Ms. Elder is not teaching she enjoys going to Disneyland and collecting Disney memorabilia.

Education: Cal Poly Pomona BA in Liberal Studies, and MA in Language and Literature. Years Teaching: 28 years teaching all at Los

Conference Schedule

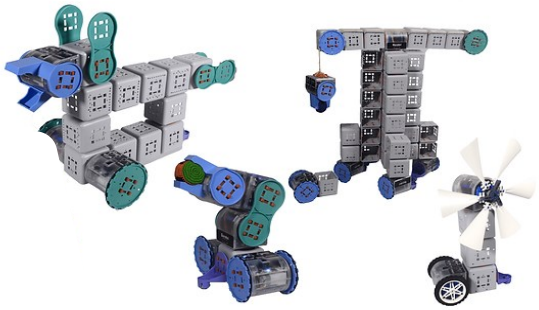
Time & Room	Event
7:30 – 8:10 am Registration: Entrance	**Breakfast and Registration**
8:10 – 8:20 am Room 104	**Getting Started** Deepika Srivastava, STEAM & Innovation Coordinator, Redlands Unified School District
8:20 – 8:30 am Room 104	**Welcome** Dr. Ken Wagner, Assistant Superintendent on Educational Services, Redlands Unified School District
8:30 – 8:40 am Room 104	**C-STEM Program** Dr. Harry Cheng, Professor and Director, UC Davis C-STEM Center
8:40 – 8:55 am Room 104	**Keynote Speech: Engaging and Empowering All Students to Excel in Math and CS** Speaker: Mary Nicely, Chief Deputy Superintendent, California Department of Education Moderator: Dr. Barbara Nemko, Superintendent of Schools, Napa County
9:00 – 9:30 am Room 104	**Superintendent, Teacher and Students Plenary Panel Session** Speakers: Mauricio Arellano, Superintendent, Redlands USD Dr. Alfonso Jimenez, Superintendent, Hacienda La Puente USD Deepika Srivastava, STEAM & Innovation Coordinator, Redlands USD Patricia Elder, Teacher, Hacienda La Puente USD Students from Hacienda La Puente USD Students from Redlands USD Moderator; Dr. Harry Cheng
9:30 – 9:45 am	**Break**
9:30 – 12:00 pm	**Mini RoboPlay Competition with Six Teams of Students** 9:30AM - 10:30AM - Students work together in teams to solve challenges. 10:30AM - 12:00PM - Judging time!

Conference Schedule

Time & Room	Event
9:45 – 10:45 am 1A: Room 104 1B: Room 107 1C: Room 105 1D: Room 106	**Breakout Session 1** Breakout Session 1A: Introduction to C-STEM Program, and Hands-on Coding and Robotics Experience for Administrators and Counselors (Bring-Your-Own-Computer) Breakout Session 1B: Getting Started with Hands-on C-STEM Coding, Robotics, and Curriculum for the Absolute Beginner of Teachers (Bring-Your-Own-Computer) Breakout Session 1C: Integrating C-STEM Coding and Robotics into Teaching Elementary Math Schoolwide Breakout Session 1D: UCD/UCR CS Supplementary Teaching Credential Authorization Program
10:45 – 11:00 am	Break and Watch Mini RoboPlay Competition
11:00 – 12:00 pm 2A: Room 104 2B: Room 107 2C: Room 105 2D: Room 106	**Breakout Session 2** Breakout Session 2A: Hands-on Experience on CMS, and Engaging Multilingual Learners and Students with Special Needs to Learn Math with Coding and Robotics for Administrators and Counselors (Bring-Your-Own-Computer) Breakout Session 2B: C-STEM for CTE, CS, Science Education (Bring-Your-Own-Computer) Breakout Session 2C: Integrating Coding and Robotics into Middle School Math Breakout Session 2D: After school and Summer Robotics Camps for Learning Math
12:00 – 1:00 pm	Lunch and Networking
1:15 – 2:15 pm 3A: Room 104 3B: Room 107 3C: Room 105 3D: Room 109	**Breakout Session 3** Breakout Session 3A: Showcase of Leaning: Elementary Math and CS/STEAM with Coding and Robotics Breakout Session 3B: Arduino: Introduction to Basic electronics and Creative Problem Solving for Physical Computing (Bring-Your-Own-Computer) Breakout Session 3C: Integrating C-STEM Coding and Robotics into Alg1, Geo, Alg2 or Integrated Math I, II, and III Breakout Session 3D: Full STEAM Ahead: Creating Art, Animations, Music, and STEAM in your school (Bring-Your-Own-Computer)
2:15 – 2:30 pm	Break

Conference Schedule

Time & Room	Event
2:30 – 3:30 pm 4A: Room 104 4B: Room 107 4C: Room 105 4D: Room 109	**Breakout Session 4** Breakout Session 4A: Showcase of Learning Middle School Math and CS/STEAM and Coding and Robotics Breakout Session 4B: AP Computer Science Principles with Robotics Breakout Session 4C: RoboPlay Competition, GIRL/GIRL+ Camps, and Ujima GIRL Project Breakout Session 4D: Full STEAM Ahead: Engaging Students with Art, Animations, Music, and Makerspace for Learning STEAM (Elementary School)
3:30 – 4:00 pm	**Closing and Raffle** Networking and Raffle: 5 Arduino Basic Kits 3 Arduino Starter Kits 2 Linkbot Super Kits All attendees will be entered in the raffle! *Must be present to win.*



Legend

- **A** – Appropriate for Administrators
- **B** – BYOD-Bring Your Own Device (Windows 10 or above, MacOSX 10.13 or above, Chromebook with Chrome OS v. 89 or above)
- **E** – Appropriate for Elementary School
- **M** – Appropriate for Middle School
- **H** – Appropriate for High School

Breakout Sessions

Session 1: 9:45am—10:45am

1A

A B

104

1A: Introduction to C-STEM Program, and Hands-on Coding and Robotics Experience for Administrators and Counselors (Bring-Your-Own-Computer)

Facilitators:
Harry Cheng, Director UC Davis C-STEM Center
Jeff Hescox, Education Service Manager, UC Davis C-STEM Center

Description:
This session will cover an overview of the C-STEM program and provide first-hand experience on getting started on your own computer. Experience how easy it is to set up and how fun it can be to learn through coding and robotics. Learn how to get started with C-STEM coding and robotics program in your school and district.

1B

E M H B

107

1B: Getting Started with Hands-on C-STEM Coding, Robotics, and Curriculum for the Absolute Beginner of Teachers (Bring-Your-Own-Computer)

Facilitator:
Dr. Larry Lagerstrom, Chief Academic Officer, Barobo, Inc.

Description:
This session will cover an overview of the C-STEM program and provide first-hand experience on getting started on your own computer. Experience how easy it is to set up and how fun it can be to learn through coding and robotics. Learn how to get started teaching with C-STEM coding and robotics.

1C

E A

105

1C: Integrating C-STEM Coding and Robotics into Teaching Elementary Math Schoolwide

Moderator:
Amy Pedersen, Principal, Woodlake Elementary Community Charter, LAUSD
Dr. Andrea McClain, Principal, Chaparral Academy, Fontana USD
Eric Francis, Teacher, Fontana USD

Description:
Learn from C-STEM elementary school administrators and teachers how to implement the C-STEM program school wide and transform sites into STEM schools. During this informative session, administrators will share practical, actionable insights for funding, including specific budget strategies and other funding ideas. They will also provide specific details on how they integrated the program both vertically and horizontally across different grade level and subjects, as well as provided professional development for teachers. In addition, Teachers will show how math, CS, and robotics are integrated into K-5 grades. Don't miss this exciting opportunity to learn from experienced educators and take your school's STEM education to the next level.

Breakout Sessions

Session 1: 9:45am—10:45am

1D

E M H A

106

1D: UCD/UCR CS Supplementary Teaching Credential Authorization Program

Moderator:
Dr. Christina Pierce, Director, Curriculum/Instruction and Academic Enrichment Education Support Services, San Bernardino County Office of Education

Speakers:
Annette Webb, Associate Dean, Director of Education, Academic Affairs, UCR Extension
Hillary Wolfe, Executive Director of College, Career & Economic Development, Fontana USD
Joanne Chan, Coordinator, Educational Services, Hacienda La Puente USD
Adam Johnson, 5th grade Teacher, Kimberly Elementary School, Redlands USD

Description:
Gain insights on how partnerships with UCD C-STEM and UCR Extension have helped school districts receive funds from the Commission on Teacher Credentialing (CTC) to support teacher professional development. In partnership with UCR Extension, UC Davis C-STEM offers a course pathway for teachers to earn a CS Supplementary Teaching Credential Authorization. Learn more about this program and how K-12 teachers can participate.

Breakout Sessions

Session 2: 11:00am—12:00pm

2A

E A

104

2A: Hands-on Experience on CMS, and Engaging Multilingual Learners and Students with Special Needs to Learn Math with Coding and Robotics for Administrators and Counselors (Bring-Your-Own-Computer)

Facilitators:
Jeff Hescox, Education Service Manager, UC Davis C-STEM Center
Vitaly Orlav, Teacher, Cope Middle, Redlands USD

Description:
In this session, administrators will learn how teachers have access to a broad range of tools, including RoboBlocky CMS, to connect and engage with students. In this hands-on session, participants will learn strategies to engage all students using the RoboBlocky curriculum, with a particular focus on students with special needs and multilingual learners.

Breakout Sessions

Session 2: 11:00am—12:00pm

2B

E M H B

2B: C-STEM for CTE, CS, Science Education (Bring-Your-Own-Computer)

Facilitator:
Dr. Larry Lagerstrom, Chief Academic Officer, Barobo, Inc.

Description:
Gain hands-on experience of the CS Standards Compliant C-STEM K-12 CS/STEAM with Robotics curriculum. Learn how these curriculum can be taught standalone or integrated into existing CS, CTE, engineering, and science courses.

2C

M A

2C: Integrating Coding and Robotics into Middle School Math

Moderator:
Dr. Fred Uy, Director, Educator & Leadership Programs , Co-Director, Center for the Advancement of Instruction in Quantitative Reasoning, CSU Office of the Chancellor

Speakers:
Michelle Center, 7th/8th Grade Math Teacher, Beattie Middle, Redlands USD
Sam Higbee, Teacher, Orange Grove Middle, Hacienda La Puente USD
Marissa Blessum, Teacher, Cedarlane Academy, Hacienda La Puente USD

Description:
Experienced C-STEM teachers will guide participants through hands-on examples using coding and robotics to teach middle school math. Participants will discover how coding and robotics directly support students' math, critical thinking, and problem solving skills in a unique, engaging way. This session will also explore how C-STEM is currently being used in middle school math and math support classes.

105

2D

E M H A

2D: After school and Summer Robotics Camps for Learning Math

Moderator:
Robert Schwandt, Asst. Director of Educational Technology, Alvord USD

Speakers:
Joanne Chan, Coordinator, Educational Services, Hacienda La Puente USD
Ricardo Recinos, Technology TOSA, Robotics Summer Program Lead, Hacienda La Puente USD
Dr. Honey Sacro Swem, Coordinator, Elementary Instruction, Fontana USD
Janice Taylor, 4th Grade Teacher, North Tamarind Elementary, Fontana USD
Amber Rosales, Teacher Math Intervention, Bryn Mawr Elementary, Redlands USD

Description:
The C-STEM Afterschool and Summer Robotics Camps for Accelerated Math Learning are designed for local schools and districts to host for their K-12 students. These programs use robotics projects and real-world problem solving to create engaging and impactful learning experiences that help students accelerate and deepen their understanding of math. The programs also offer recreational opportunities and encourage peer-mentoring and teamwork. Join this session to learn how you can bring these C-STEM Expanded Learning Programs to your schools, districts, and communities.

106

Breakout Sessions

Session 3: 1:15pm—2:15pm

3A

E
A

3A: Showcase of Leaning: Elementary Math and CS/STEAM with Coding and Robotics

Moderator:
Dr. Sharisa Chan, Digital Learning and Computer Science Project Specialist, San Bernardino County Office of Education

Speakers:
Jennie Dyerly, Principal, Crafton Elementary, Redlands USD
Shanna Bhatt, 4th Grade Teacher, Crafton Elementary, Redlands USD
Taylor Brudin, 5th Grade Teacher, Crafton Elementary, Redlands USD
Kari Morgan, Math Intervention and M.S. Instructional Technology Teacher, Crafton Elementary, Redlands USD

Description:
In this session, seasoned educators and their students from Crafton Elementary in Redlands USD will demonstrate how implementing C-STEM has led to increased student engagement and learning in elementary math. You'll have the chance to watch elementary students as they work on the RoboBlocky math curriculum, and see their enthusiasm and engagement while learning math. By joining this session, you'll discover how the C-STEM Program can revolutionize math education at the elementary level.

104

3B

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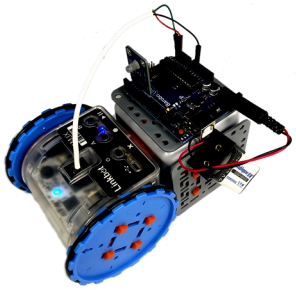
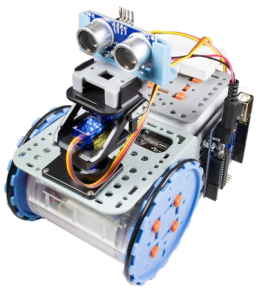
3B: Arduino: Introduction to Basic electronics and Creative Problem Solving for Physical Computing (Bring-Your-Own-Computer)

Facilitator:
Dr. Larry Lagerstrom, Chief Academic Officer, Barobo, Inc.
Cory Elgin, Math and C-STEM Teacher, Moore Middle, Redlands USD

Description:
Arduino can be integrated into Math, Computer Science, Engineering, and Robotics Courses, as well as after school/expanded programs and summer camps to facilitate a technologically advanced learning environment.

Join this hands-on session to get started using Arduino microcontrollers with RoboBlocky. This session will explore an introduction to Physical Computing with Arduino by combining the hands-on projects of physical computing with the simplicity of block-based programming. Discover the endless possibilities of physical computing and how to incorporate modern do-it-yourself electronics into your classroom teaching.





107

3C

H
A

105

3C: Integrating C-STEM Coding and Robotics into Alg1, Geo, Alg2 or Integrated Math I, II, and III)

Moderator:
Dr. Judy Fancher, Assistant Superintendent, Curriculum, Instruction & Assessment, PreK-12, Hacienda La Puente USD
Allen Thoe, Computer Science and Math Teacher, Citrus Valley High School, Redlands USD
Jeff Hescox, Education Service Manager, UC Davis C-STEM Center

Description:
The C-STEM Mathematics with Robotics curriculum, including 20 UCOP A-G Approved C-STEM courses, has had proven success in increasing student engagement and learning at the secondary level. Hear how a panel of Secondary School Math teachers have incorporated the C-STEM curriculum into high school math classes and how it maps to the big ideas in the upcoming new state math framework. Join this session to learn more about how the C-STEM Program can transform math education at the secondary level.

3D

M
H
A

109

3D: Full STEAM Ahead: Creating Art, Animations, Music, and STEAM in your school (Bring-Your-Own-Computer)

Moderator:
Ruth Thompson, Teacher, La Merced Intermediate, Redlands USD

Facilitators:
Lorraine Torres, Teacher-Computer Science. STEAM, NGSS, Math and Music, La Merced Intermediate, Montebello USD
Jasmine Smith, 8th grade Math Teacher, Beattie Middle, Redlands USD

Description:
This session shows how the C-STEM program integrates Art into STEAM education by giving students the opportunity to explore their artistic and creative talents using music and visual media. See how C-STEM's curriculum and activity resources support the development of artistic talents through various channels including drawing, storytelling, playing and composing melodies, learning math with a piano, and image processing. Explore how quickly and easily reconfigurable and modular Linkbot systems can be assembled by easily snapping parts together to accomplish various tasks and solve challenges. With a robotics-based STEAM makerspace, students will discover new ways to solve problems by designing, building, and testing their own robotics systems.

4A

E M A

104

4A: Showcase of Learning: Elementary and Middle School Math and CS/STEAM with Coding and Robotics

Moderator:
Dr. Helene Cunningham, Director, Curriculum, Instruction, Assessment, P-12, Hacienda La Puente USD

Speakers:
Joe Erven, Executive Director, Innovation & Excellence, Orange USD
Greg Miller, C-STEM Resource Teacher, UC Davis C-STEM Certified Educator, Orange USD
Dr. Monica Murray, Principal, West Orange Mathematics Academy, Orange USD
Jeff Morgan, Principal, Portola Middle, Orange USD
Ricardo Maldonado, Math and C-STEM Elective Teacher, Portola Middle, Orange USD
Students from Orange USD

Description:
Join Orange USD administrators, teachers, and their students in this session as they showcase the impact of implementing C-STEM on increasing student engagement and math proficiency in elementary and middle schools. Learn why they have changed the school name from West Orange Elementary School to West Orange Mathematics Academy after working with C-STEM. You'll have the opportunity to watch students working on the RoboBlocky math curriculum, and witness their enthusiasm for and engagement with the subject. By attending this session, you'll gain insights on how the C-STEM Program can transform math education at the elementary and middle school levels.

4B

H A

107

4B: AP Computer Science Principles with Robotics

Speakers:
Dr. Larry Lagerstrom, Chief Academic Officer, Barobo, Inc.

Description:
Join this session to learn about new C-STEM AP Computer Science Principles course. Unlike other APCSP courses, this course uses virtual robots and optional hardware robots. Many robotics and coding features are specifically developed for students to learn computer science principles and prepare them for the corresponding AP exam.

4C

E M H A

105

4C: RoboPlay Competition, GIRL/GIRL+ Camps, and Ujima GIRL Project

Speakers:
Merry Kim, Assistant Director for Partnerships, UC Davis C-STEM Center
Marcella Grant, Ujima GIRL Program Manager, UC Davis C-STEM Center
Mini RoboPlay Competition Team Advisors
Learn how to promote diversity and inclusion with C-STEM Expanded Learning Programs.

Description:
Discover how GIRL/GIRL+ Camps, summer camps motivate middle and high school girls to learn STEM and computing concepts through robotics. And the Ujima(GIRL) Project aims to address the significant challenges of inclusion and equity for Black/African American middle school and high school girls in STEM education. The project will empower over 2,000 girls to become leaders in science, technology, engineering, and mathematics (STEM) in their schools, communities, and future careers.

RoboPlay Competition is a level-playing field robotics competition with a focus on applying math in solving real-world problems. It provides an opportunity for K-12 students to showcase their math problem-solving skills.

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4D: Full STEAM Ahead: Engaging Students with Art, Animations, Music, and Makerspace for Learning STEAM (Elementary School)

Moderator:
Jeff Hescox, Education Service Manager, UC Davis C-STEM Center

Facilitators:
Caitlin Arakawa Redlands USD
Roland Hosch, Redlands USD

Description:
This session shows how the C-STEM program integrates Art into STEAM education by giving students the opportunity to explore their artistic and creative talents using music and visual media. See how C-STEM's curriculum and activity resources support the development of artistic talents through various channels including drawing, storytelling, playing and composing melodies, learning math with a piano, and image processing. Explore how quickly and easily reconfigurable and modular Linkbot systems can be assembled by easily snapping parts together to accomplish various tasks and solve challenges. With a robotics-based STEAM makerspace, students will discover new ways to solve problems by designing, building, and testing their own robotics systems.

Join us for a Mini RoboPlay Competition Demonstration!

See how you can bring the C-STEM RoboPlay Competition to your class, school, district or county.

RoboPlay Competition is a level-playing field robotics competition with a focus on applying math in solving real-world problems. It provides an opportunity for K-12 students to showcase their math problem-solving skills, creativity, and teamwork. The Mini RoboPlay Competition demonstration will feature six teams of 4-5th grade students, one team each from six elementary schools with three to five students per team. The competition will take place from 9:30AM to 12:00PM at the C-STEM Symposium.

- 7:30AM - 8:00AM Student teams check in for Mini-RoboPlay Competition.
- 8 AM - 8:10AM Welcome, Review of important rules for competition, and distribution of challenges
- 8:10AM - 9:30AM Student teams attending the Symposium welcome, keynote and plenary sessions.
- 9:30AM - 10:30AM Student teams will receive three RoboPlay challenges at 9:30am and have one hour to work together to find solutions.
- 10:30AM - 12:00PM Judging time! Each team will have two 10-minute sessions to showcase their solutions to the judges for scoring.
- 12:00PM -12:30PM Lunch for students
- 12:30PM - 12:45APM Awards ceremony and group photos

Joint UC Davis/UC Riverside Extension Computer Science Supplementary Credential Authorization



The UC Davis C-STEM Center has over a decade of experience in providing professional development for K-12 teachers, including those without any prior coding experience, on computer science (CS) and integrating CS into STEAM education. Starting Summer 2022 in partnership with UC Riverside Extension, C-STEM Professional Development will be centered around the California Computer Science Supplementary Teaching Credential Authorization.

The following sequence of professional development courses in the Computer Science Supplementary Teaching Credential Authorization Program will meet the California Commission on Teacher Credentialing (CTC) requirements. They will prepare K-12 teachers to teach a comprehensive computer science curriculum.

- **Introduction to Teaching Computer Science**
- **Programming and Integration of CS into STEAM Teaching**
- **Development of Integrated CS and STEAM Curriculum with Physical Computing**
- **Computer Programming in C**
- **Data Structures and Software Design**

Complete four courses to earn an Introductory Authorization and teach in grades 9 and below, or add the fifth course to earn a Specific Authorization to teach up through grade 12. Teachers will be able to teach CS classes or integrate CS and data science into their existing classroom teaching with computational thinking, computing practice and programming, impacts of computing, physical computing, Arduino as a device for data collection and analysis with visualization, data structures and algorithms, software design, etc., aligned with Common Core State Standards (CCSS) Math, Next Generation Science Standards (NGSS), and English Language Arts

> *"Oh my gosh! I barely can contain myself….soooo fun!!! So challenging and so rewarding at the same time!!!"*
>
> — Jessica Fernandez, Math Teacher, Glen Edwards Middle School, California

> *"I really loved this training. In over 20 years of teaching I can't remember another one I enjoyed so much."*
>
> — Sandy Andersen, Math Teacher, La Sierra High School, California

> *"The trainers did an amazing job taking very divergent topics (programming, robotics, math) and making it all very accessible for me. It all came together."*
>
> — Glen Warren, McPherson Magnet, Orange Unified School District

> *"I learned that I love computer programming and if you can get me to love this than you must be doing something right! If I love it then it will be so much easier to inspire my students."*
>
> — Amber Rafferty at Cambridge Elementary

Robotics Camps for Math, STEAM, and Leadership

After school and Summer Robotics Camps for Learning Math

The C-STEM Robotics Camps provide K-12 students with a fun and empowering way to learn math through collaborative robotics projects and real-world problem-solving. These camps also offer opportunities for teamwork, peer-mentoring, and the development of communication, presentation, and leadership skills. The curriculum integrates math with coding, engineering, science, art, and music to create a comprehensive and hands-on learning experience.

Girls in Robotics Leadership (GIRL/GIRL+) Summer Camps

The Girls in Robotics Leadership (GIRL/GIRL+) Summer Camps provide middle and high school girls with engaging hands-on coding and robotics activities and peer-mentoring to foster their interest in STEM fields. The week-long GIRL Camp for middle school girls encourages leadership and role-modeling while building confidence through group projects and presentations.

The GIRL+ Camp for high school girls delves into advanced coding, physical computing with Arduino, and robotics, while also emphasizing teamwork and leadership skills. The camps can be hosted by any school, district, college, or university using C-STEM GIRL/GIRL+ camp curriculum.

Ujima (Collective Work and Responsibility) Girls in Robotics Leadership Project

The Ujima Girls in Robotics Leadership (GIRL) Project, funded by the NSF with $2.4M, aims to address the challenges of inclusion and equity for Black/African American middle and high school girls in STEM education. Over 2,000 Black girls will be mentored through hands-on coding and robotics to develop leadership skills and positive attitudes towards STEM.

The project includes peer-mentoring with Black college female students, Ujima GIRL Camps, and Ujima GIRL Clubs in schools to inspire peers and girls in feeder elementary schools. The project creates a self-sustaining mentoring pipeline, with camp participants returning as counselors and mentors. The project is a three-year collaboration between the UC Davis C-STEM Center, Umoja Community Education Foundation, industry partners, and California county offices of education and school districts.

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