2015 California STEM Symposium
Designing Our Future

ANAHEIM CONVENTION CENTER
October 29-30, 2015

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The California STEM Symposium is brought to you by:
October 29, 2015

Dear Symposium Attendee:

It is my sincere pleasure to welcome you to the 2015 California STEM Symposium.

This one-of-a-kind gathering is a showcase of science, technology, engineering, and mathematics (STEM) programs, curriculum, and resources. In addition, the conference will highlight the California State Standards for English Language Arts and Mathematics, the California Next Generation Science Standards, and career technical education. It is an opportunity for more than 300 presenters to share their best practices and for more than 2,500 attendees to develop new ideas and network with colleagues.

California’s rich cultural diversity has always been its strength, providing the talent, drive, and creativity to preserve and enhance our state’s leadership in technology, entertainment, agriculture, and so many other fields. Jobs in engineering, science, and other STEM fields pay more, on average, than jobs in other fields. In addition, they fuel California’s economy, keeping it a global leader in technology. Yet only 15 percent of those with engineering degrees are women, and only 42 percent of those who hold jobs in life sciences are women. In addition, African Americans and Latinos are underrepresented in STEM fields. With our combined efforts, we can expand involvement in these underrepresented areas.

Last month I released *A Blueprint for Environmental Literacy: Educating Every California Student In, About, and For the Environment*. This Blueprint will guide how environmental literacy should best be integrated with all of California’s standards, which will support and further STEM learning in our schools.

This year’s STEM Symposium is organized around the following strands: Diversity, Girls, and Inclusion in STEM; Business, Community, and Post-Secondary Partnerships; STEM Learning Across Disciplines; STEM in Out-of-School/Expanded Learning and Pathways; STEM and the Arts; and Leadership in STEM.

I hope that you enjoy the third annual STEM Symposium and that you will bring back ideas and tools to enhance and support STEM education in your schools and expanded learning programs.

Thank you for your work in preparing California’s students to become our country’s future STEM innovators, workforce, and inspiration.

Sincerely,

Tom Torlakson
State Superintendent of Public Instruction
Welcome to the 3rd Annual California STEM Symposium!

Whether this is your first time attending the California STEM Symposium or you’ve been with us since the beginning, we are so glad to have you here in Anaheim—just around the corner from the “Happiest Place on Earth!”

Each year, the Californians Dedicated to Education Foundation and our partners, the California Department of Education and the California Commission on the Status of Women and Girls, work together to bring you an event that highlights the importance of bringing access to high-quality STEM education to all students.

From our diverse and celebrated Keynote Speakers, to the roundtable discussions led by your peers, to the presentations by proud students in our Share Fair, and to the brand-new Makerspace (brought to us by Sonoma State University), once again our focus is on the important role STEM plays in a well-balanced, 21st-century education.

The remodeling of California’s public education system is well underway and we know educators like you are hard at work in implementing these updates. While there may be some dust and noise, education in California is moving forward in a gradual, sensible, and collaborative way to better meet the needs of all of our students and prepare them as tomorrow’s workforce.

STEM learning helps to develop the kinds of knowledge and skills we know students need to be prepared for college and their future careers. Critical thinking, collaboration, explaining answers, and learning from mistakes: these are the skills students develop through a strong STEM education. Like strands in a rope, they are woven together to help students succeed when they enter the world outside of the classroom. Each strand is stronger and serves students better when it is tightly woven together with the rest. These skills strands are flexible and versatile, and can be woven into all sorts of ropes that can be used in school and in life. But students need opportunities to test and apply them—weaving and reweaving the strands into different ropes.

As a STEM educator, you facilitate this weaving in your classroom, your afterschool and summer programs, and in your communities. Over these next two days, we hope you will take advantage of opportunities to learn new ways of bringing STEM to life for students, meeting and talking with your peers and collaborators, and sharing what works for you.

Thank you for joining us and for all you do for kids every day. Have fun!

With admiration,

Shelly Masur, CEO
Californians Dedicated to Education Foundation
Dear Friends:

In 2015, women still hold only 25 percent of our country’s STEM jobs. Studies by STEMConnector.org found:

- Female high school students are significantly less likely than their male counterparts to have plans to pursue a college major or career in STEM (15 percent vs. 44 percent).
- Male students are about eight times more likely to say they plan to pursue a career in Engineering or Technology than female students.
- 80 percent of female students interested in a STEM major or career plan to specifically pursue the Sciences, compared to only 30 percent of male students interested in a STEM major.

The California Commission on the Status of Women and Girls is proud to, once again, partner with the Californians Dedicated to Education Foundation to bring you the 2015 California STEM Symposium, along with the California Department of Education and the State Superintendent of Public Instruction, Tom Torlakson. What started three short years ago has developed into a much-acclaimed opportunity to bring STEM leaders and practitioners together. Our focus on innovative ways to engage students, families, schools, libraries, educators, businesses, and communities is central to California’s efforts to build a diverse highly-skilled 21st-century science, technology, education, and mathematics workforce.

Thank you for your commitment to California’s next generation of STEM innovators. We are confident that you will leave this conference with new ideas and creative ways to inspire girls to explore new areas of interest and stay focused on STEM learning.

Geena Davis, Chair

Commissioners Lupita Cortez Alcala, Kafi Blumenfield, Assemblymember Nora Campos, Lauri Damrell, Senator (ret.) Martha M. Escutia, Assemblymember Cristina Garcia, Marina Illich, Assemblymember Jacqui Irwin, Senator Hannah-Beth Jackson, Senator Carol Liu, Senator Holly Mitchell, Karen Nelson, Julie Su, Alisha Wilkins, and Major Ofelia Alvarez-Willis

Nancy Kirshner-Rodriguez, Executive Director
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**Name Badges** (obtained at registration booths) are required for entrance to all keynotes, sessions, meals, and events.
Schedule of Events
All listed events are at the Anaheim Convention Center

Wednesday, October 28
4:00 p.m. – 7:00 p.m. Early Registration

Thursday, October 29
7:30 a.m. – 5:00 p.m. Registration open
7:30 a.m. – 8:15 a.m. Continental Breakfast in Exhibitor Marketplace (Hall B)
7:30 a.m. – 5:00 p.m. Exhibitor Marketplace (Hall B)
7:30 a.m. – 1:00 p.m. Makerspace (Hall B)
8:15 a.m. – 9:30 a.m. Opening Session and Keynote Speaker (Hall A)
9:30 a.m. – 5:00 p.m. Student/Teacher Share Fair and Project Demonstrations (2nd Floor Lobby)
9:40 a.m. – 10:55 a.m. Breakout Session I: Presentations
11:05 a.m. – 12:20 p.m. Breakout Session II: Presentations and Round Tables
12:30 p.m. – 1:45 p.m. Luncheon and Keynote Speaker
1:55 p.m. – 3:10 p.m. Breakout Session III: Presentations
3:00 p.m. – 5:00 p.m. Makerspace (Hall B)
3:10 p.m. – 3:30 p.m. Afternoon Break (Exhibitor Marketplace in Hall B)
3:30 p.m. – 4:45 p.m. Breakout Session IV: Presentations and Round Tables
5:15 p.m. – 7:00 p.m. Networking Reception and Makerspace Demonstrations (Convention Center Grand Plaza)

Friday, October 30
6:45 a.m. - 1:30 p.m. Registration open
6:45 a.m. Doors open for Continental Breakfast (Hall A)
7:00 a.m. – 7:50 a.m. Keynote Speaker (Hall A)
7:00 a.m. – 12:15 p.m. Exhibitor Marketplace and Makerspace (Hall B)
8:00 a.m. – 9:15 a.m. Breakout Session V: Presentations
9:25 a.m. – 10:40 a.m. Breakout Session VI: Presentations and Round Tables
10:50 a.m. – 12:05 p.m. Breakout Session VII: Presentations
12:15 p.m. – 1:30 p.m. Closing Session: Luncheon, Keynote Speaker, and Raffle Winners Announced
Thursday, October 29

Session I: __________________________________________ Room ________
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Second choice

Session II: __________________________________________ Room ________
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Second choice

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Session IV: _________________________________________ Room ________
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Friday, October 30

Session V: _________________________________________ Room ________
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Second choice
## Sessions at a Glance

### Thursday, October 29, 2015 • Session I – 9:40 a.m. to 10:55 a.m.

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- 1. STEM Learning Across Disciplines
- 2. Leadership in STEM
- 3. STEM in Out-of-School/Expanded Learning and Pathways
- 4. STEM and the Arts
- 5. Business, Community, and Postsecondary Partnerships
- 6. Diversity, Girls, and Inclusion in STEM
## Sessions at a Glance

**Thursday, October 29, 2015 • Session III – 1:55 p.m. to 3:10 p.m.**

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### GRADE SPAN

- **PreK-2 (PK-2)**
- **3-5 (3-5)**
- **Middle School (MS)**
- **High School (HS)**
- **Postsecondary (P)**

### TARGETED AUDIENCE

- PreK-12 Educators (E)
- Administrators (A)
- Out-of-School/Extended Learning (O)
- Community (C)
### Sessions at a Glance

#### Thursday, October 29, 2015 • Session IV – 3:30 p.m. to 4:45 p.m.

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<td>212A</td>
<td>Developing STEM Modules for Your Classroom</td>
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<tr>
<td>212B</td>
<td>STEAM and Engineering: Creating Creative Minds</td>
<td>159</td>
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<tr>
<td>213A</td>
<td>Grant Proposal Writing for STEM Teachers</td>
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<td>Project Prototype: Further Lessons Integrating Engineering in the Science Classroom</td>
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<td>Making STEM Matter: Interactivity of the Digital and Physical World</td>
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<tr>
<td>213D</td>
<td>Noches de Ciencias: Pathway to Engaging Parents and Empowering Students</td>
<td>397</td>
<td>3</td>
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<td>O</td>
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</tbody>
</table>

**GRADE SPAN**
- PreK-2 (PK-2)
- 3-5 (3-5)
- Middle School (MS)
- Postsecondary (P)
- High School (HS)

**TARGETED AUDIENCE**
- PreK-12 Educators (E)
- Administrators (A)
- Out-of-School/Extended Learning (O)
- Community (C)
## Sessions at a Glance

**Friday, October 30, 2015 • Session VI – 9:25 a.m. to 10:40 a.m.**

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<tr>
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<td>201B</td>
<td>Intersection Between STEM and the Built Environment</td>
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<td>Teaching Integrated Mathematics 1 with Computing and Robotics</td>
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<td>Re-Engineering Instruction to Highlight STEM Throughout the Day</td>
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<td>202A</td>
<td>Scientists and Engineers: Preparing and Placing STEM Professionals in Classrooms</td>
<td>433</td>
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<td>202B</td>
<td>Handing Over the Reins: STEM Students Designing New Community Futures</td>
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<td>203A</td>
<td>Shifting the Lessons: Turning One Dimension into Three Dimensions</td>
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<td>Leadership in Middle School Mathematics</td>
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<td>STEM Outreach to Girls: Ensuring Equity in Schools</td>
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<td>Designing Professional Development to Make Mathematics Accessible to All Students</td>
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<td>Science and Environmental Engineering for Secondary (SEES) Teachers</td>
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<td>Contextualized Chemistry: Bringing Career Relevance to Your Classroom</td>
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<td>Exploring Two Paths to Gender Equity in STEM Extracurricular Activities</td>
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<td>Strengthening STEM in Local Control and Accountability Plans</td>
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<td>It’s Elementary: STEM That Is!</td>
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<td>Scaffolding Learning to Build Potential in All Kids: Exploring Computer Science</td>
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<td>Partnerships that Transform: STEM Learning Is Everywhere and Everyone</td>
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<td>Implementing the NGSS One Layer at a Time</td>
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<td>Learning Design While Meeting Local Community Needs</td>
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<td>210D</td>
<td>Gizmos: Using Online Simulations to Improve Conceptual Understanding in Science</td>
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<td>NGSS Engineering Design in the Middle School Physical Science Classroom</td>
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<td>STEM and the Arts: It Is an Interdisciplinary World</td>
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<td>Why Girls Love and Leave STEM</td>
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<td>Will and the Waste Monster</td>
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<td>Let’s Talk STEAM in the Classroom</td>
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<td>Making More Out of Mathematics Activities</td>
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<td>204B</td>
<td>Round Table Presentations</td>
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### Sessions Categories

1. STEM Learning Across Disciplines
2. Leadership in STEM
3. STEM in Out-of-School/Expanded Learning and Pathways
4. STEM and the Arts
5. Business, Community, and Postsecondary Partnerships
6. Diversity, Girls, and Inclusion in STEM
## Sessions at a Glance

**Friday, October 30, 2015 • Session VII – 10:50 a.m. to 12:05 p.m.**

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<td>An Innovative Approach to Recruiting and Retaining Women in Engineering</td>
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<td>Preparing Low-Income and Minorities for STEM Careers</td>
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<td>Community Collaborations and Developing STEM Teachers: Lessons Learned</td>
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<td>Turning Toys into Tools</td>
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<td>Designing a Freshmen Seminar Program to Improve Recruitment and Retention of Female Engineering Students</td>
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<td>Full STEAM Ahead!</td>
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<td>Trash-to-Fash: Recycled Fashion Show</td>
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<td>204B</td>
<td>Maker Education From Kindergarten to Career: What’s Next for the Maker Movement</td>
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<td>Supporting Students’ Argumentation Writing in Science</td>
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<td>Saturday Engineering Buddies</td>
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<td>iPad-ography: Using iPads and Devices for More than Pictures</td>
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<td>Improving Representation in STEM Through Novel Assessment and Curricular Interventions</td>
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<td>Arts, STEM, and Teacher Preparation</td>
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<td>NextGen ASET: Tools to Critically Examine NGSS in K-12 Classrooms</td>
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<td>Somis STEAM Family Nights</td>
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<td>Latinas in STEM: Showcasing Talent</td>
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<td>Digging Deeper into the NGSS Crosscutting Concepts</td>
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<td>Smart Gardens Supporting STEM Learning</td>
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<td>Integrating the NGSS and STEM in the Middle School Science Classroom</td>
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<td>Death Finds the Mesozoic: Incorporate NGSS Science and Engineering Practices into Physical and Earth Science</td>
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<td>209B</td>
<td>Badges? Maybe We Need Some Stinking Badges!</td>
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<td>Graphical Analysis: At the Intersection of Mathematics and Science</td>
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<td>California Blueprint for Environmental Literacy: Fundamental to 21st-Century STEM</td>
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<td>STEAM All Aboard!</td>
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<td>Integrating Genetics and Statistics to Address NGSS and CCSSM</td>
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<td>Project-Based Experimental Design for the Classroom</td>
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<td>The Los Angeles River: Design Thinking + Civic Participation = Change</td>
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<td>Engineering Practices in an Elementary Classroom</td>
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<td>Teacher Tools: Assessing Student Understanding in the NGSS Classroom</td>
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<td>Urban EcoLab: Environmental Science for the Modern City</td>
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<td>Grab Your LEGO$s! It’s Robotics Time!</td>
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**GRADE SPAN**

- PreK-2 (PK-2)
- Middle School (MS)
- Postsecondary (P)
- High School (HS)
- 3-5 (3-5)

**TARGETED AUDIENCE**

- PreK-12 Educators (E)
- Administrators (A)
- Out-of-School/Extended Learning (O)
- Community (C)
Chevron at a Glance

Maker Education from Kindergarten to Career: What’s Next for the Maker Movement

Date: Friday, October 30
Time: 10:55 a.m. – 12:05 p.m. (Session VII)
Location: Room 204B

Leaders from every level of the education to career pathway will discuss how policymakers, businesses, administrators, and educators can influence what is next in the maker movement, and how we can collaborate to inspire the next generation of innovators, entrepreneurs, and critical thinkers.

Moderator: Blair Blackwell, Manager, Education and Corporate Programs, Chevron
Panelists:
- Trey Lathe, Ph.D., Executive Director, MakerEd
- Ann Houtman, Dean, School of Natural Sciences, Mathematics and Engineering, California State University, Bakersfield
- Phil Gonsalves, Director of Science and Math Curriculum and Instruction, West Contra Costa Unified School District
- Ron Way, Dean Emeritus, Industry and Technology Division, El Camino College

Reactor: Kathleen M. Knutzen, Ph.D., Dean, School of Social Sciences and Education, California State University, Bakersfield

Additional Special Session Hosted By Chevron

Inspiring Interest in STEM via Informal Education: the San Francisco 49ers and Chevron Change the Game

Date: Thursday, October 29
Time: 1:55 p.m. – 3:10 p.m. (Session III)
Location: Chevron Human Energy Lounge

The 49ers are using the game of football and Levi’s Stadium—the most technologically advanced sports venue in the world—as a platform to inspire children grades K-8 to engage with and develop an interest in STEM. With the help of Chevron, the 49ers’ programs reached more than 31,000 participants with Common Core- and NGSS-aligned lessons and tour experiences in the 2014-2015 school year and will extend that reach to more than 60,000 this year. Join Museum Director Jesse Lovejoy for a casual conversation on how to use kids’ fundamental interest in the things they love and demonstrate that STEM is real, it’s fun, and it’s everywhere. This session will be a roadmap to how the 49ers are doing that, and how every teacher can also do so.

Jesse Lovejoy, M.A., Museum and Center Director, The San Francisco 49ers

Chevron Involvement in Other Panels

Programs and Strategies for Supporting Girls in STEM

Date: Thursday, October 29 • Time: 11:05 a.m. – 12:20 p.m. (Session II) • Location: Room #205A
Moderator: Luz Rivas, Founder and Executive Director, DIY Girls
Chevron Role: Panelist - Andrea Bailey, Community Engagement Manager, Chevron

Outside-In: Drivers of Highly Effective After School and Summer STEM Learning

Date: Thursday, October 29 • Time: 3:30 p.m. – 4:45 p.m. (Session IV) • Location: Room 201A
Moderator: Joan Bissell, Ed.D., Director, Teacher Education and Public School Programs, California State University
Chevron Role: Reactor - Blair Blackwell, Manager, Education and Corporate Programs, Chevron

Partnerships that Transform: STEM Learning Is Everywhere and Everyone

Date: Friday, October 30 • Time: 9:25 a.m. – 10:40 a.m. (Session VI) • Location: Room #207C
Moderator: Joan Bissell, Ed.D., Director, Teacher Education and Public School Programs, California State University
Chevron Role: Reactor - Blair Blackwell, Manager, Education and Corporate Programs, Chevron
INSPIRE TODAY’S STUDENTS TO BE TOMORROW’S ENGINEERS.

WE AGREE.

Today’s students go on to become tomorrow’s employees – including ours. At Chevron, we support science, technology, engineering and math education to help students develop real-world problem-solving and critical-thinking skills. We're preparing them for the opportunities ahead. It’s good for the future of our community. And our company.

Learn more at chevron.com
**Day 1: Thursday, October 29**

*7:00 a.m. – 1:00 p.m. & 3:00 p.m. - 5:00p.m.: Makerspace in Exhibit Hall*

**Makerspace Quick-talk and Hands-on Demonstration Schedule**

7:30 – 7:40 a.m. Quick-talk #1: Advice for Creating a Makerspace  
*Stephanie Chang & Jakki Spicer, MakerEd*

7:45 – 7:55 a.m. Quick-talk #2: How to Be a STEAMY K-8 Admin  
*Melissa Becker & Gina Silveira, Maker Certified Instructors*

8:00 – 8:10 a.m. Quick-talk #3: STEAM Superheroes  
*Kristin Farr, KQED*

3:15 – 3:30 p.m. Hands-on Demonstration #1: Beyond the Hour of Code: Programming in 6-12th Grades  
*Casey Shea, Sacramento County Office of Education and Maker Certified Instructor*

4:45 – 4:55 p.m. Quick-talk #4: Define, Design and Share: The KQED STEM Media Challenge  
*Andrea Aust, KQED*

**Making at the Networking Reception (Grand Plaza)**

5:15 – 6:30 p.m. Hands-on Demonstration #2: Bright Lights, Big STEM Circuitry  
*Julia Marrero & Kaki McLachlan, Maker Certified Instructors*

5:15 – 6:30 p.m. Hands-on Demonstration #3: Artful Arguments: Supporting & Questioning Conclusions on Social Media  
*Annelise Wunderlich, KQED*

**Day 2: Friday, October 30**

*7:00 a.m. – 12:15 p.m.: Makerspace in Exhibit Hall*

**Makerspace Quick-talk Schedule**

7:15 – 7:30 a.m. Quick-talk #5: How to Assess Making  
*Stephanie Chang & Jakki Spicer, MakerEd*

7:35 – 7:50 a.m. Quick-talk #6: Building Buy-in: Making Maker Educators out of Colleagues and Parents  
*Jessica Parker & Gina Silveira, Maker Certified Instructors*
Ignite your passion for tinkering, creating, and making in our MAKERSPACE
JUST BRING YOUR CURIOSITY!

Stop by the Exhibit Hall MAKERSPACE to make something totally cool to take home!

A MAKER IS...
...a tinkerer
...an experimenter
...an inventor
...a risk taker
...a problem solver
...a creator
...an artist
...a scientist
...an active learner
...an engineer
...a designer

LASER CUTTING
CIRCUIT BUILDING
3-D PRINTING
PROGRAMMING
LOW-TECH MAKING
DESIGNING

www.thestartupclassroom.org/maker-course
<table>
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<td><strong>Exhibit Hall B • Thursday, October 29 • 7:30 a.m. – 5:00 p.m.</strong></td>
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<tr>
<td><strong>Friday, October 30 • 7:00 a.m. – 12:15 p.m.</strong></td>
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LEGO Education  
Booth 300  
education.lego.com

littleBits  
Booth 605  
littlebits.cc

Nasco  
Booth 334  
www.enasco.com

National Geographic Learning/  
Cengage Learning  
Booth 305  
negl.cengage.com

National Math + Science Initiative  
Booth 230  
www.nms.org

NSTA - eCYBERMISSION  
Booth 226  
www.ecybermission.com

Ocean Institute  
Booth 106  
www.ocean-institute.org

Paton Group  
Booth 127  
www.patongroup.com

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Booth 429

Paxton Patterson  
Booth 228  
www.paxtonpatterson.com

Pearson  
Booth 231  
www.pearsonmylabandmastering.com

E.A.T. Foundation  
Booth 126  
www.eatfdn.org

Santa Monica Pier & Heal the Bay  
Booth 330  
www.healthebay.org/santa-monica-pier-aquarium

School Technology Resources  
Booth 607  
www.strscopes.com

Silicon Valley Education scopes Foundation  
Booth 430  
svefoundation.org

SolidProfessor  
Booth 603  
www.solidprofessor.com

Start Engineering  
Booth 431  
start-engineering.com

STEMfinity  
Booth 416  
www.stemfinity.com

Studica Inc.  
Booth 530  
www.studica.com

The MiniOne Electrophoresis  
Booth 527  
theminione.com

The Rainforest Art Project  
Booth 335  
childrensrainforest.com

The University of Texas at Austin  
Booth 235  
www.edb.utexas.edu/education/departments/ci/programs/stem

Trash for Teaching  
Booth 529  
www.t4t.org/about

Universal Technical Institute  
Booth 233  
www.uti.edu

University of California, Riverside Extension  
Booth 128  
www.extension.ucr.edu

Vernier Software & Technology  
Booth 434  
www.vernier.com

VWR International  
Booth 333  
us.vwr.com/store

zSpace, Inc.  
Booth 332  
zspace.com
CTSOs and Promoting STEM Student Leadership

**Booth #1**
Visit with state officers from California Career Technical Student Organizations (CTSOs) and learn how the organizations have impacted their lives leading to career and education success.

*Clay Mitchell, Education Programs Consultant, California Department of Education*

Environment-Based Education

**Booth #2**
The California Department of Education promotes environment-based education through the California Regional Environmental Education Community (CREEC), the Environmental Education Initiative (EEI), and the California Environmental Education Interagency Network (CEEIN). These initiatives and networks are committed to providing teachers, students, and the general public with quality environmental education materials and programs.

*Shannon Gordon, Education Programs Consultant, California Department of Education*

Engineering Your Own $80 Prosthetic Arm

**Booth #3**
Using readily available materials and an Arduino kit, students build prosthetic arms that duplicate actions of human arms (grasp, pick up, carry, throw, etc.) and use them to perform a series of tasks. The objective is to provide a low-cost alternative prosthetic for people who cannot afford a typical model or live in environments without sophisticated technology available.

*Juanita Muniz-Torres, Statewide Director of MESA Programs, MESA*

CDI/CDC: Technology Enrichment Project

**Booth #4**
See Continuing Development Inc./Child Development Center’s Technology Enrichment Project, designed to build students’ 21st-century learning skills through imaginative and meaningful uses of technology. Students choose a program that interests them and work independently and collaboratively on projects, while having opportunities for critical thinking and reflection that showcase their creativity.

*Jorrel Batac, Technology Enrichment Specialist, Continuing Development Inc./Child Development Center*

Aerial Wilderness Distress Monitor and Search System

**Booth #5**
See a demonstration of a Lemelson-MIT InvenTeam funded STEM program invention project: a search drone communications system for locating lost hikers in remote wilderness areas. Once the drone detects a signal emitted by a radio transmitter, geo-tagged image snapshots and GPS coordinates are saved onto flash memory.

*Tinh Tran, STEM Teacher, University High School InvenTeam*
Ferrofluid Magnetic Nanotechnology Applications

**Booth #6**

Ferrofluid magnetic nanotechnology can be used as a bio-medical application to treat localized disease as well as for commercial uses such as audio speakers, sensors, switches, and solenoids. The magnetic nanoparticles present a magnificent artistic demonstration for education, allowing students to create to the limits of their imagination.

*Dennis Reams, Science Teacher, Vista Verde Middle School*

FIRST Robotics - Team 1622 Spyder

**Booth #7**

Come and see Team Spyder 1622’s FRC robot in action! FIRST Robotics shows all students that science, technology, and problem-solving are fun and rewarding, and can lead to successful careers in technology. FIRST robotics projects encourage students to pursue science or engineering in college and be skilled future employees and citizens.

*Rodger Dohm, Teacher, Poway High School Robotics*

Learn to Code

**Booth #8**

Experience creative computing with MIT’s Scratch programming language, using a design-based learning approach. Tap your student’s creativity and allow them to convert from a consumer of technology to a producer. Engaging in the creation of computer games prepares students for careers as computer programmers and more.

*Greg Beutler, Director, TechsCool*

Extreme STREAM by Elementary Students

**Booth #9**

At Skyline Elementary’s STREAM lab, students are empowered to think critically, communicate effectively, and collaborate successfully while developing their passion and talents in STEM. Students present creative solutions to real-world problems and demonstrate the results of STREAM learning.

*Gina Thackrey, STREAM Teacher On Special Assignment, Solana Beach School District*

Block-Based Programming

**Booth #10**

Middle and high school students exhibit creativity and computational thinking skills while programming using a block-based language. For most students, this was their first programming experience.

*Visa Thiagarajan, Computer Science Teacher, Basis Independent Silicon Valley*
Palm Digital
Booth #11
Palm Middle School students in the Palm Digital programming electives and After School Clubs demonstrate their coding skills in Web Design and Development and Game/App Development that they have learned in the middle school piece of the district’s K-12 Computer Science pathway.

Gayle DiCarlantonio, Teacher, Palm Middle School

Moreno Valley Math League
Booth #12
See how Moreno Valley Math League harnesses out-of-the-box thinking and builds the competencies of students through Project-Based Learning to invigorate students’ critical thinking skills and interpersonal skills while concurrently transforming students who were technology consumers into potential technology creators and innovators.

Deepika Srivastava, Coordinator-Moreno Valley Math League, Moreno Valley Unified School District

Kids Electronics Lab and STEM Discoveries
Booth #13
The Kids Electronics Lab (KEL) provides a unique environment and experience for students ages 8-16 to learn the basics of electronics and STEAM. Based on the Learn, Create, and Share concept, the program focuses on teaching, creating, sharing, and challenging the young minds through fun and engaging activities. A KEL website with more information is at www.podpi.com.

Stephane Come, Founder, KIDS 2.0 Foundation

We want your feedback!
Please complete the session and Symposium surveys. For each survey completed, you increase your chances of winning a prize!
Opening General Session and Keynote

Exhibit Hall A, 8:15 a.m. to 9:30 a.m.

Presentation of Colors and Pledge of Allegiance

Sunburst Youth Challenge Academy

Cadet Connor Couch
Color Guard Commander/Leading the Pledge of Allegiance

Sergeant Chang and Sergeant Munoz
Military Officers working with Sunburst Color Guard

National Anthem

Cadet Katrina Sullivan
Sunburst Youth Challenge Academy

Welcome and Keynote Speaker

Conference Welcome

Shelly Masur
CEO of Californians Dedicated to Education Foundation

Shelly Masur is the CEO of Californians Dedicated to Education Foundation. She brings almost twenty years of successful experience working as an educational leader with youth-serving non-profits and in 2013 was named as one of the “100 Women of Influence” by the Silicon Valley Business Journal. She is currently a school board member in the Redwood City School District in San Mateo County.
Opening General Session
Thursday, October 29 • 8:15 a.m. – 9:30 a.m.

**Introduction**

Lupita Cortez Alcalá  
*Deputy Superintendent, Instruction and Learning Support Branch  
Office of State Superintendent of Public Instruction, Tom Torlakson*

Lupita Cortez Alcalá is Deputy Superintendent of the Instruction and Learning Support Branch with the California Department of Education. Ms. Alcalá oversees the program areas of English/language arts, history/social science, visual/performing arts, teacher support, English learners and migrant students, curriculum and instructional resources, early childhood programs, science, technology, engineering, and mathematics, high school initiatives, career technical education and adult education. She is a graduate of Harvard University’s School of Education, with over 16 years of experience in education, government affairs for K-12 and higher education, and is a commissioner on the California Commission on the Status of Women and Girls.

**Tom Torlakson**  
*State Superintendent of Public Instruction*

As elected chief of schools for all of California, Tom Torlakson oversees the education of 6.3 million children attending more than 10,000 schools in 1,100 districts across the state. Every day, he applies his experiences as a science teacher, high school coach, and state lawmaker to fighting for our students and improving our state's public education system.

**Keynote Speaker**

Leland Melvin  
*NASA Astronaut and STEAM Explorer*

**Bio:** Leland’s story is a fascinating look at how resilience and passion led him from the NFL to NASA. Before becoming an astronaut, he played professional football with the Detroit Lions and the Dallas Cowboys. Armed with a BS in Chemistry and a MS in Materials Science Engineering, he traveled off-planet twice on Space Shuttle Atlantis to help build the International Space Station. By working on such high stakes teams, Leland developed a deep and nuanced understanding of effective team dynamics.

Upon hanging up his space boots, he led NASA Education and co-chaired the White House’s Federal Coordination in STEM Education Task Force, developing the nation’s 5-year STEM education plan.

After 24 years with NASA as a researcher, astronaut, and Senior Executive Service leader, Leland travels around the world to inspire the next generation of explorers to pursue STEAM careers.

**Topic: From the NFL to NASA: My Life in STE(A)M**

Leland will share his remarkable life story of perseverance and excellence as an athlete, astronaut, scientist, engineer, photographer, and musician.
Girls Love Robots: Inspiring Girls in STEM
Room #201A
Session ID: 5, Strand: 6, Grades: HS, Audience: E
The presenter will discuss highlights of an inspiring California pilot project partnering women engineers, female college students, and girls who worked on competitive robotics teams. The successful All Girls Event that brought everyone together at the end of the season will also be highlighted.

Nancy McIntyre, Staff, Robotics Education and Competition Foundation

STEAM Meet Arts, Media, and Entertainment
Room #201B
Session ID: 502, Strand: 4, Grades: HS, Audience: A
Explore the connection between the arts, media, and entertainment industry sectors and STEAM education, along with multiple implementation models including California Partnership Academies, Linked Learning Programs, and Specialized Secondary Programs that are engaged in STEAM education.

Jack Mitchell, Career Technical Education: STEAM Implementation, AME Model Demonstration Sites

STEM Leadership in California Green Ribbon Schools
Room #201C
Session ID: 264, Strand: 2, Grades: 3-5, Audience: A
This panel convenes honorees in the California Green Ribbon Schools program, an initiative of State Superintendent of Public Instruction Tom Torlakson, to share best practices for using sustainability and the environment as a context for learning STEM thinking skills and content knowledge, including green technologies and career pathways.

Lesley Taylor, Field Representative, California Department of Education
Ken Griest, Principal, Carmel Middle School

How Teachers Create Integrated STEM Pathway Projects and Lessons
Room #201D
Session ID: 56, Strand: 3, Grades: HS, Audience: E
See integrated STEM curriculum and Linked Learning style pathways and then get access for free! Learn how teachers worked together to create integrated curriculum on topics such as Crime Scene Science, Alternative Energy, and Media Design all linked to the Common Core State Standards and the Next Generation Science Standards.

MaryRose Lovgren, Project Coordinator, CTE Online/Butte County Office of Education
Jodi Ausland, Curriculum Specialist, CTE Online/Butte County Office of Education

Introduction of Geographic Information Systems to STEM
Room #202A
Session ID: 496, Strand: 1, Grades: HS, Audience: E
Get an introduction to Geographical Information Systems (GIS), which are designed to collect, integrate, and analyze, multiple types of spatial or geographical data. Join the discussion of how GIS can be incorporated into STEM classrooms to build students’ 21st-century skills and prepare them for the modern workforce.

Chris Breazeale, M.A., Education Programs Consultant, California Department of Education
Stacey Greer, M.A., Education Programs Consultant, California Department of Education
Grades K-2 Project-Based Learning STEAM Units

**Room #202B**

**Session ID:** 503, **Strand:** 4, **Grades:** PK-2, **Audience:** E

Learn about how one grades K-8 school has developed and implemented K-2 STEAM Project-Based Learning units aligned to state standards and get practical advice on how to implement similar projects at your school.

*Jessica Lura, M.A., Director of Strategic Initiatives and Partnerships, Bullis Charter School*

*Nancy Barlow, MakerSpace Teacher, Bullis Charter School*

Career Technical Education: Student Leadership Matters

**Room #203A**

**Session ID:** 441, **Strand:** 2, **Grades:** HS, **Audience:** E

Student leadership is a key component to the success of your STEM Career Technical Education program. Student leaders will share their experiences and ideas related to program success.

*Clay Mitchell, State Director, SkillsUSA California*

Training Future Cyber Security Professionals

**Room #203B**

**Session ID:** 113, **Strand:** 3, **Grades:** HS, **Audience:** O

Learn highlights of the district’s innovative cyber security program, which creates a career pathway for students in the field of cyber security. Students are provided hands-on training in technical skills in computer security and defense against cyber attacks, culminating with participation in the National CyberPatriot competition.

*Alvaro Cortés, Executive Director, Los Angeles Unified School District, Beyond the Bell Branch*

*Harry Talbot, Ed.D., Administrative Coordinator, Beyond the Bell*

Developing a Next Generation Science Standards Implementation Plan

**Room #204A**

**Session ID:** 466, **Strand:** 2, **Grades:** MS, **Audience:** E

Districts face several decisions regarding steps and strategies for developing an effective implementation plan. Learn what one district has done to create a multi-year plan that prepares teachers for creating more student-centered science classrooms.

*Katherine Schenkelberg, M.A., Assistant Principal and Science Professional Development, Torrance Unified School District*

*Chad Mabery, Ed.D., Director of Data, Assessment, and Professional Development, Manhattan Beach Unified School District*

iPad Tablets Invade Middle School Science Classrooms

**Room #204C**

**Session ID:** 6, **Strand:** 1, **Grades:** MS, **Audience:** E

Experience innovative lessons that incorporate iPads into middle school science courses. Learn how iPads can provide a platform for easily differentiating lessons, as well as increasing student engagement.

*Maggie Mabery, M.A., Middles School Science Teacher and 2015 Teacher of the Year, Manhattan Beach Unified School District*

*James Locke, M.A., Middle School Science Teacher, Manhattan Beach Unified School District*
It’s Never Too Early to Start Coding!

Room #205A

Session ID: 84, Strand: 1, Grades: PK-2, Audience: E

New innovations allow educators to bring algorithmic thinking and coding skills to students of all ages. Come see demonstrations of apps, online resources, and a surprise visit from the robots Dash and Dot!

Aileen Rizo, Mathematics Consultant, Fresno County Office of Education

Rebooting Computer Science Education with the New Principles Course

Room #205B

Session ID: 418, Strand: 6, Grades: HS, Audience: E

Explore how the new Advanced Placement Computer Science Principles course makes computer science accessible to wider populations by focusing on the creative aspects of computing and the role computers play in society. Learn how teachers are crafting their own courses to fit this new approach.

Francisco Nieto, EdTech Program Manager, Alameda County Office of Education - Core Learning Division
James Town, M.Ed., Mathematics Specialist, Alameda County Office of Education - Core Learning Division

STEAM Lab and School Garden in a Dual Immersion Setting

Room #206A

Session ID: 100, Strand: 1, Grades: 3-5, Audience: E

Are you struggling to implement STEAM within the walls of your classroom? Come learn about the Viejo Elementary Organic School Garden and STEAM Lab and how these two projects are integrated across the curriculum. Hear how teachers successfully integrate STEAM, the garden, and the Common Core State Standards.

Lauren Guite, M.A.T., Lead Teacher, Capistrano Unified School District - Viejo Elementary School
Leslie Ramirez, M.A., First Grade Teacher, Capistrano Unified School District - Viejo Elementary School

The Gender Divide and Digital Learning in STEM Fields

Room #206B

Session ID: 399, Strand: 6, Grades: HS, Audience: E

Hear the Speak Up Project Research annual survey results and discuss promising practices for erasing gender divides in learning. Learn about the connection between gender differences in student use of digital resources and how girls want to use technology to explore STEM fields.

Ann McMullan, Consultant, Project Tomorrow

Demystifying Everyday Devices: Physics Principles at Work

Room #207A

Session ID: 156, Strand: 3, Grades: HS, Audience: O

Being adept at using technology is useful, but when students know how and why it works, they can design anything they imagine! Beneath the slick exterior of today’s electronics, simple principles are at work. No longer reserved for Advanced Placement Physics courses, STEM brings engineering and design within reach of all students.

Kim Thomas-Barrios, Ed.D., Executive Director, USC Educational Partnerships, USC Neighborhood Academic Initiative, University of Southern California
Stacy Sinclair, Ed.D., Adjunct Faculty, University of Southern California, Rossier School of Education
Fostering a Risk-Taking Culture During a Time of Change

**Room #207B**

**Session ID: 451, Strand: 6, Grades: 3-5, Audience: A**

Engage in an interactive presentation on creating a culture of risk-taking by teachers and students alike. Special emphasis will be spent on how to motivate under-represented populations, such as girls, to develop a genuine interest in the STEM fields as early as elementary school.

*Jennifer Bourgeois, Coordinator, Student Assessment and Educational Measurement, Orange Unified School District*

**Integrating Mathematics, Robotics, and Circuitry**

**Room #207C**

**Session ID: 314, Strand: 1, Grades: MS, Audience: E**

Join discussions on middle school-level connections between mathematics, robotics (VEX IQ robot), coding (Scratch and Modkit), and circuitry (Snap Circuits). Hear about the implementation of these strategies in professional development with teachers taking part in a California Mathematics and Science Partnership.

*Tony Alteparmakian, Ed.D., Assistant Professor, California State University, Bakersfield*

**The "STEM" Behind Hollywood**

**Room #207D**

**Session ID: 30, Strand: 1, Grades: HS, Audience: C**

This hands-on session shows how to "STEM" the zombie tide! Create learning moments with pop culture crazes in the classroom. The presenter will show how STEM concepts and practices can be integrated into the zombie and forensics entertainment genres used in the Hollywood entertainment field.

*Jeff Lukens, Teacher, Sioux Falls, South Dakota Schools*

**STEM: Including Students with Special Needs**

**Room #208A**

**Session ID: 8, Strand: 6, Grades: HS, Audience: E**

Assistive Technology can foster enthusiasm for STEM in special needs populations through greater access to curriculum and information, networking with peers, completing assignments, and participating in class. This workshop also highlights successful leaders in STEM fields with disabilities.

*Jonn Paris-Salb, Assistive Technology Consultant, California Department of Education*

**STEAMing into the 21st-Century!**

**Room #208B**

**Session ID: 511, Strand: 1, Grades: MS, Audience: E**

Hot air balloons, dragsters, coding, robotics, and rockets! Use exciting cross-curricular projects to prepare students for careers in science, technology, engineering, arts, and mathematics. Obtain STEAM projects and activities that pull a wide range of skills into any learning environment and create a deep understanding, while sending students STEAMing into 21st-century careers.

*Crystal Dira, Technology Teacher, South Pointe Middle School*

*Kellie Muragishi, Science Teacher, South Pointe Middle School*
"LeverGizing" Mathematics in Engineering Contexts

**Room #209A**

**Session ID:** 115, **Strand:** 1, **Grades:** HS, **Audience:** A

Experience a hands-on integrated engineering performance task. Learn how Engineering and Mathematics Inspiring Thinking Solutions (EMITS), a California Mathematics and Science Partnership, connects real-world engineers with mathematics, science, and engineering teachers through performance tasks to deepen mathematical concepts in an engineering context.

*Christine Poulsen, M.Ed., EMITS Project Director, Sacramento County Office of Education*

*David Chun, K-12 Mathematics Curriculum and Instruction Director, Sacramento County Office of Education*

Making a Makerspace?

**Room #209B**

**Session ID:** 328, **Strand:** 2, **Grades:** MS, **Audience:** A

Experience Makerspace in this interactive workshop, while learning about best practices in planning, building, staffing, and integrating a Makerspace into classrooms, libraries, or schools.

*Sylvia Martinez, M.A., Author, Invent To Learn*

From Virtual to Visual: Weaving Art into Applied Mathematics

**Room #210A**

**Session ID:** 220, **Strand:** 4, **Grades:** 3-5, **Audience:** E

What ancient art form provides fresh drinking water, can hold 500 people at one time, and feeds people around the globe every day? Come experience a hands-on 3-D digital/analog integrated program making STEM and the Arts relevant and engaging, while resulting in gains in mathematics performance.

*Christi Wilkins, Executive Director, Dramatic Results*

Community and Student Relations Through STEM

**Room #210B**

**Session ID:** 523, **Strand:** 5, **Grades:** HS, **Audience:** C

See the Center for Land-Based Learning’s two hands-on, Project-Based Learning programs that successfully incorporate STEM themes through agriculture and natural resource experiences. Come learn how partnerships are developed and get ideas to engage your communities to help students learn about STEM careers and opportunities through interactions with community partners.

*Stephanie Etcheverria, FARMS Leadership Program Director, Center for Land-Based Learning*

*Nina Suzuki, SLEWS Director, Center for Land-Based Learning*

SciTech: Empowering Girls Through After School Science Programs

**Room #210C**

**Session ID:** 484, **Strand:** 6, **Grades:** 3-5, **Audience:** O

Take a walk through the challenges and successes of implementing a long-term, deep-impact after school science program for girls. SciTech provides girls from underprivileged areas in San Diego a chance to explore fields such as computer programming, biotechnology, structural engineering, meteorology, and renewable energy, while emphasizing career paths in STEM.

*Jessica Mata, Inquiry Institute Manager, Reuben H. Fleet Science Center*
Digging into Depth of Knowledge Through Mathematics Tasks
Room #210D

Session ID: 214, Strand: 1, Grades: MS, Audience: E

Learn how rigorous Open Middle mathematics problems at multiple Depth of Knowledge (DOK) levels can help your students. Problems begin with the same task and end with the same answer, yet allow for multiple solving methods. Participants will complete mathematics tasks, watch videos of students solving them, and receive hundreds of free problems.

Robert Kaplinsky, M.A., Teacher Specialist, Downey Unified School District

Robotics for Grades K-6 Classrooms
Room #211A

Session ID: 108, Strand: 1, Grades: 3-5, Audience: E

Build a robot! This hands-on workshop has attendees build a simple robot while discovering how to teach robotics as an integrated unit in a grades K-6 classroom. Depart with free and affordable resources for robotics projects, along with interdisciplinary units aligned with the Next Generation Science Standards and Common Core State Standards.

Gina Thackrey, STREAM Teacher On Special Assignment, Solana Beach School District

How Mathematics and Science Can Inspire Teachers and Students in the Preschool Classroom
Room #211B

Session ID: 239, Strand: 1, Grades: PK-2, Audience: E

Presenters share inspiring examples of interactions that may occur when teachers and students explore and learn together. Experience these examples through video and hands-on activities. Then, choose an area of focus and apply the Guiding Principles to curriculum planning for mathematics and science.

Heidi Mendenhall, M.A., CPNI Manager, WestEd
Sarah Bollingmo, Ph.D., CPIN Region 9 Lead, WestEd

Teaching Mathematics and Science with LEGO Mindstorms
Room #212A

Session ID: 469, Strand: 1, Grades: HS, Audience: A

Engage in the hands-on experience on how to use LEGO Mindstorms for teaching the Common Core State Standards for Mathematics and the Next Generation Science Standards through the University of California, Davis C-STEM curriculum. Participants are welcome to bring laptops and their own LEGOs to try out this engaging curriculum.

Ryan Mangan, M.A., Education Specialist/Technology Coordinator, University of California, Davis C-STEM Center
Harry H. Cheng, Ph.D., Professor and Director, University of California, Davis C-STEM Center

Creating a Culture of Scientific Inquiry Throughout the Program Day
Room #212B

Session ID: 238, Strand: 1, Grades: PK-2, Audience: E

Teachers currently implementing the Guiding Principles from the California Preschool Curriculum Frameworks share examples of how to create a culture of scientific inquiry and mathematical thinking throughout the day. Using critical thinking, problem solving, collaboration, communication, and creativity, participants will develop plans for creating a culture of scientific inquiry and mathematical thinking.

Robyn Solansky, Preschool Director, Thermolito School District
Heidi Mendenhall, M.A., CPIN Manager, WestEd
Expanding STEM Through K-16 Partnerships: The Hands-On Lab
Room #213A
Session ID: 373, Strand: 5, Grades: MS, Audience: E
In this hands-on workshop, learn integrated STEM mini-lessons. Faculty at California State University, Chico worked together with grades K-12 teachers through established partnerships in the Hands-On Lab undergraduate teaching course to develop the mini-lessons for K-16 classrooms as introductions to extended investigations and entry points to the process of reflective teaching.

Brian Lindaman, Assistant Professor, Department of Mathematics and Statistics, California State University, Chico
Bev Marcum, Professor, Department of Biological Sciences, California State University, Chico

Marine Debris: It’s Everywhere, Even in Schoolyards!
Room #213B
Session ID: 202, Strand: 3, Grades: MS, Audience: E
Educators can engage students in a global issue with local solutions through scientific data collection. Students plan a project, carry it out, and propose solutions that impact their daily lives. Students and teachers can access and contribute to a large, international dataset.

Annie Kohut Frankel, Education Coordinator, California Coastal Commission

Literacy and Writing in Science
Room #213C
Session ID: 330, Strand: 1, Grades: MS, Audience: E
Literacy and Writing in Science, LAWS, is a supplemental curriculum developed by and for teachers designed to engage and stimulate student inquiry and analysis of scientific problems aligned with the Next Generation Science Standards while supporting English-Language Arts literacy and writing expectations required by the Common Core State Standards.

Rachel Murillo, Teacher/Author, Long Beach Unified School District
Heather Valdespino, Teacher/Author, Long Beach Unified School District

Zero To STEM...Continued
Room #213D
Session ID: 409, Strand: 2, Grades: 3-5, Audience: E
Emblem Academy is in its third year of implementing its grades PreK-6 Ethics, Science, Technology, Engineering, Entrepreneurship, and Mathematics program (ESTEEM). Come prepared to participate in an interactive discussion about the successes and challenges of establishing and continuing an Elementary STEM Program with minimal funding.

Jon Baker, M.A., Principal, Saugus Union School District - Emblem Academy
Maria Blue, M.A., Teacher, Saugus Union School District - Emblem Academy

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PREPARING THE EDUCATION LEADERS OF THE FUTURE

The California State University Salutes the 2015 California STEM Symposium

We proudly support your outstanding work advancing the Common Core and Next Generation Science Standards. Throughout our 23 campuses, the CSU is preparing education leaders whose talent, creativity, and drive will build and sustain California’s future.

The California State University Congratulates the Makerspace Team Led by Sonoma State University and its School of Education

Its work is outstanding, advancing the Maker Movement and the connections with the Next Generation Science Standards and the engineering design process.

Please visit the Makerspace in the Exhibit Hall to have the experience of a lifetime!

Learn more about Sonoma State University’s Maker Educator Certificate Program:
www.thestartupclassroom.org/maker-course
Continuous Improvement for STEM in Expanded Learning Programs

Room #201A

Session ID: 124, Strand: 3, Grades: 3-5, Audience: O

California’s public Expanded Learning Programs are required to implement data-based continuous improvement processes. What might continuous improvement look like? What kinds of data can programs collect for improvement? Researchers from SRI Education will share insights about the continuous improvement framework, the improvement process, data collection, and recommendations for moving forward.

Patrik Lundh, Education Researcher, SRI Education
Ann House, Researcher, SRI Education

STEM Grant Writing 101

Room #201B

Session ID: 301, Strand: 2, Grades: MS, Audience: E

“How am I going to pay for that?” Find answers to this all-important question with STEM grant writing! Learn about the procedures and processes necessary for successful STEM grant writing, and how to submit both private and federal grant applications.

Jennifer Janzen, Science Coordinator, Santa Clara County Office of Education

Teachers and Students Measuring the Outer Solar System

Room #201C

Session ID: 413, Strand: 3, Grades: HS, Audience: C

The Research and Education Collaborative Occultation Network (RECON) is an innovative citizen-science astronomy research effort involving teachers, students, and amateur astronomers from over 50 communities across the western United States to measure the sizes and characteristics of Kuiper Belt Objects out beyond Neptune’s orbit.

John Keller, Associate Professor, Physics, California Polytechnic State University, San Luis Obispo

Weaving the Environment into Three-Dimensional Learning

Room #201D

Session ID: 228, Strand: 1, Grades: 3-5, Audience: E

Learn about California’s five Environmental Principles and Concepts (EPandC), along with the Education and the Environment Initiative (EEI) curriculum, which incorporates the EPandCs. Hear experiences from a teacher of how EEI and the EPandCs can support the transition to the Next Generation Science Standards.

Bryan Ehlers, Program Director, Office of Education and the Environment, CalRecycle

Next Generation Science Standards Notebooks to Support STEM

Room #202B

Session ID: 463, Strand: 1, Grades: HS, Audience: E

Explore notebooking strategies that align the three dimensions of the Next Generation Science Standards to implement three-dimensional teaching and learning when using notebooks as a platform to deliver content and infuse experimentation in the classroom in preparation for STEM.

Henry Shimojyo, Chemistry Teacher, Lake Elsinore Unified School District
Yamileth Shimojyo, Science Coordinator, Riverside County Office of Education
Cisco and MESA Mentor Program: Matching Students with Industry Professionals

Room #203A

Session ID: 416, Strand: 5, Grades: P, Audience: C

This presentation will provide highlights of a successful three-year mentoring program pairing Cisco employees with MESA undergraduate students. Gain information on how to prepare students for opportunities of engagement and mentoring with industry professionals.

Mae Cendana-Torlakson, Corporate Partnerships Liaison, University of California-MESA
Jessica Graham, Government and Community Relations, Cisco
Nilgun Ozer, Ph.D., MESA Director, San Francisco State University

STEM and Science Lessons on the Playground

Room #203B

Session ID: 9, Strand: 3, Grades: 3-5, Audience: O

Turn the school playground into a STEM laboratory using simple strategies that combine play and learning. Participants will see hands-on learning science lessons demonstrated using the playground setting.

Erin Foster, Program Naturalist, Inside the Outdoors/Orange County Department of Education
Kelly Ellis, M.S., Instructional Programs Assistant, Inside the Outdoors/Orange County Department of Education

Implementing a STEM Quality Criteria Rubric to Promote Successful STEM Efforts

Room #204A

Session ID: 34, Strand: 1, Grades: MS, Audience: A

A hands-on STEM session that demonstrates how the San Diego STEM Quality Criteria Rubric can be used to self-assess and set goals to successfully promote STEM efforts in schools or districts will be discussed.

John Spiegel, M.A., Science Coordinator, San Diego County Office of Education
Mary Kraus, M.A., Project Specialist Online/Blended Learning, San Diego County Office of Education

Making to Learn: Bringing an Academic Focus to Maker Education

Room #204C

Session ID: 298, Strand: 1, Grades: HS, Audience: E

Explore a new approach to Make that begins with content standards and allows for creativity and choice. Discover how Make and content may be integrated in the classroom.

Anna Van Dordrecht, M.A., Teacher on Loan for Science, Sonoma County Office of Education
Matt O’Donnell, Technology Innovation Specialist, Sonoma County Office of Education

Igniting the Passion for STEM Education

Room #205A

Session ID: 236, Strand: 3, Grades: HS, Audience: O

A student’s vision of participating in a solar car competition has grown from discussion to reality in growing rigorous STEM programs within Palmdale High School’s academy. Hear from students, teachers, and administrators on how this project went beyond expectations in addressing gender equity, college preparation, and enhancing STEM business partnerships.

Elizabeth McKinstry, M.A., Director, Antelope Valley Union High School District
Kristina Ramos, M.A., Principal, Antelope Valley Union High School District - Palmdale High School
Designing an Information Communication System

**Room #205B**

**Session ID: 32, Strand: 1, Grades: MS, Audience: A**

Developed by the Smithsonian Science Education Center explicitly for the topic arrangement of the Next Generation Science Standards, this is a hands-on workshop to design, build, and test prototypes of information communication systems incorporating electricity and waves. This lesson is from the new middle school STC Program: MYGEN Edition of Electricity, Waves, and Information Transfer.

*Gina Wofford, Senior Curriculum Account Manager, Carolina Biological Supply Company*

Programs and Strategies for Supporting Girls in STEM

**Room #206A**

**Session ID: 316, Strand: 6, Grades: MS, Audience: O**

The California Girls Collaborative in STEM is a network of programs and organizations that actively support girls in STEM learning opportunities. Panelists will share specific resources, program strategies, and approaches drawn from innovative programs that effectively support girls in engaging and learning STEM.

*Luz Rivas, Founder and Executive Director, DIY Girls*

Equity and Innovation: Computer Science Pathways for Grades 7-12

**Room #206B**

**Session ID: 14, Strand: 2, Grades: HS, Audience: E**

Equity and innovation are driving the Sweetwater Union High School District’s commitment to making computer science courses available to students in its 25 secondary schools through collaboration by university, district, and classroom teacher leaders. Stakeholder panelists include grant directors, district administrators, program leaders, and classroom teachers.

*Katrine Czajkowski, Ph.D., Mathematics Curriculum Specialist, Sweetwater Union High School District  
Art Lopez, M.A., Teacher, Sweetwater High School, Sweetwater Union High School District*

Using Partnerships to Grow Your STEM Pathways

**Room #207A**

**Session ID: 415, Strand: 5, Grades: HS, Audience: A**

Join the Orange County Department of Education in an interactive workshop on how secondary and higher education works with a local intermediary, Vital Link, to support STEM-related Career Technical Pathway success. Focused on Engineering/Advanced Manufacturing Pathways, Project-Based Learning, and centered on the Engineering Design Principles, the resulting integrated learning and projects are amazing.

*Alisa McCord, Partnership Coordinator, Orange County Department of Education  
Kathy Johnson, CEO, Vital Link*

Start Improving Your Integrated STEM Lessons

**Room #207B**

**Session ID: 333, Strand: 1, Grades: PK-2, Audience: E**

Need starting points to creating integration across science, mathematics, and literacy, including English Language Development? Looking for technologies to enhance this learning? Demonstrations of approaches used to improve the integration of lessons at any grade level are provided.

*Sandi Yellenberg, M.A., Science Coordinator, Santa Clara County Office of Education*
Bringing Computer Science to Your K-12 Classroom: Educator Panel  
**Room #207C**  
Session ID: 419, Strand: 1, Grades: HS, Audience: C  
Code.org will convene a panel of educators who are working to spread computer science in their districts/schools. Discussions will provide in-depth information on how to bring computer science courses to classrooms across grades K-12, while describing the challenges and rewards of being pioneers in this critically important space.  
David Bernier, District Manager, Code.org

Artful Connections with Mathematics  
**Room #207D**  
Session ID: 417, Strand: 4, Grades: 3-5, Audience: E  
Teaching artists from the Armory Center for the Arts’ Artful Connections with Math program designed integrated visual arts and mathematics lessons and coached grades 2-3 teachers. This curriculum can be a model of creatively developing new STEM learning opportunities, which address the Common Core State Standards and inspire teachers in low income schools to fundamentally change instruction.  
Lorraine Cleary-Dale, M.F.A., Director of Education, Armory Center for the Arts

Creating Cognitively Demanding Mathematics and Science Tasks  
**Room #208A**  
Session ID: 374, Strand: 1, Grades: MS, Audience: E  
Use depth of knowledge to assess the cognitive demands of mathematics and science tasks. Assess and revise mathematics and science tasks, while discussing the implications of depth of knowledge on teaching in the era of the Common Core State Standards and the Next Generation Science Standards.  
Anita Kreide, Assistant Clinical Professor Center for Math and Science Teaching, Loyola Marymount University  
Dr. Amy Huang Reuben, Clinical Assistant Professor, Center for Math and Science Teaching (CMAST), Loyola Marymount University

Mathematics and Science Environment Using California’s Early Learning Foundations and Curriculum Framework  
**Room #208B**  
Session ID: 237, Strand: 1, Grades: PK-2, Audience: E  
Participants will explore integrating mathematics and science daily into the preschool environment through examples from California’s Preschool Learning Foundations and curriculum frameworks. Teachers currently implementing will share their successes and strategies, and all will model how to use ideas from these resources to develop 21st-century skills.  
Jean Barber, Ph.D., CPIN Region 9 Lead, WestEd/CPIN  
Heidi Mendenhall, M.A., CPIN Manager, WestEd

Systems, Students, Opportunities: Bridging the Gaps!  
**Room #209A**  
Session ID: 183, Strand: 6, Grades: P, Audience: A  
Join interactive discussions on equity in STEM programs. Discuss how to use data to identify gaps in girls’ and other underrepresented groups’ participation. Learn root causes and research-based solutions for STEM programs, as well as Perkins requirements as they relate to equity.  
Elizabeth Wallner, Equity Consultant, CA Perkins Joint Special Populations Advisory Committee
Popular Arts in the STEM Classroom  
**Room #209B**  
**Session ID:** 322, **Strand:** 4, **Grades:** 3-5, **Audience:** E  
Using popular arts can be a powerful teaching tool that is easily accessible and engaging. Educators will present ways to use comic arts, cartoons, and movies to explore STEM concepts and design integrated lessons.

*Danielle Lopez, M.A.Ed., Teacher, Newport-Mesa Unified School District - Davis Magnet School*  
*Summer Keller, M.A.T., Teacher, Newport-Mesa Unified School District*

**The Elephant in the Room: Access and Equity in STEM**  
**Room #210A**  
**Session ID:** 190, **Strand:** 6, **Grades:** HS, **Audience:** E  
Access and equity must be associated with the STEM movement in a state as complex and diverse as California. Learn about successful strategies and methods for ensuring that STEM can indeed reach and impact even the most underserved and under-represented.

*Carlos González, Director, UCR/BCOE MESA Program, University of California, Riverside, Bourns College of Engineering*

**Creating a 21st-Century Technology Workforce Using Scratch**  
**Room #210B**  
**Session ID:** 213, **Strand:** 1, **Grades:** MS, **Audience:** E  
Examine the Scratch programming language and how it can be blended across all subjects and curricula to deepen students' understanding of standards and concepts. Programming may develop students' logical reasoning, critical thinking, and problem solving skills, which are needed by the 21st-century technology workforce.

*Vidhi Srivastava, 7th Grade Student, Redlands Unified School District*

**An Introduction to Differentiating STEM in Grades PreK-2**  
**Room #210C**  
**Session ID:** 323, **Strand:** 1, **Grades:** PK-2, **Audience:** E  
Inspire and challenge grades PreK-2 students with engaging activities that promote critical thinking skills for all learning levels by using the Depth and Complexity framework to spark curiosity while engaging students in higher-level thinking. Practical strategies will be given on differentiating the Next Generation Science Standards along with the curriculum for the Common Core State Standards.

*Katherine Solomon, Teacher, Saugus Union School District*  
*Cindy Kirk, Teacher, Saugus Union School District*

**Preparing ALL K-2 Students to Make Sense of Word Problems**  
**Room #210D**  
**Session ID:** 122, **Strand:** 6, **Grades:** PK-2, **Audience:** E  
Participants will learn various ways to help ALL early elementary students make sense of word problems typically encountered in Common Core State Standards-aligned mathematics texts through extended classroom conversations, as well as concrete, visual, and numerical representations. Practical activities, question stems, sentence frames, and experiences from implementation will be discussed in depth.

*Stephanie Biagetti, Ph.D., Department Chair, Teaching Credentials, California State University, Sacramento*  
*Lisa Lobese, First Grade Teacher, Oak Chan Elementary School*
Integrating Media and Technology into Science Instruction for Young Children

**Room #211A**

**Session ID:** 101, **Strand:** 1, **Grades:** PK-2, **Audience:** E

Join the Gateways East Bay STEM Network in this practical workshop, sharing rationale and methods for effectively integrating media and technology into developmentally, culturally, and linguistically appropriate science instruction for children in grades PreK-2. Learn to use media and technology to increase time engaged in interactive science activities.

*Bruce Simon, Associate Director, Gateways East Bay STEM Network*
*Savitha Moorthy, Ph.D., Education Researcher, Center for Technology in Learning, SRI International*

Inquiry-Based Laboratory: Transition Your Favorite “Cookbook” Labs

**Room #211B**

**Session ID:** 339, **Strand:** 1, **Grades:** HS, **Audience:** E

Don’t throw your traditional “cookbook” labs out with the bath water. Transition them to high-level guided or open-inquiry investigations. Gain insight on how to restructure your favorite laboratory activities to student-designed investigations that incorporate the Science and Engineering Practices of the Next Generation Science Standards.

*Ron Michelotti, M.S., STEAM Teacher, Anaheim Union High School District*

Going from STEM to STEAM

**Room #212A**

**Session ID:** 425, **Strand:** 4, **Grades:** MS, **Audience:** E

Sample activities and hear about early results of the implementation of a STEAM lab at Oakland School for the Arts, where projects are created to be meaningful in academic courses and relevant in the arts.

*Julie Humphrey, Science Department Chair, Oakland School for the Arts*

Pit and the Pendulum: English-Language Arts, Mathematics, and Physics Together

**Room #212B**

**Session ID:** 120, **Strand:** 1, **Grades:** HS, **Audience:** E

Participants will experience an English-Language Arts activity leading into investigations to discover and experience parts of a unit of instruction that use standard deviation and curve fitting to determine the time period of a pendulum.

*James Short, M.Sc., Math Coordinator, Ventura County Office of Education*

Searching for Computer Science: Access and Barriers in U.S. K-12 Education

**Room #213A**

**Session ID:** 151, **Strand:** 6, **Grades:** MS, **Audience:** A

This two-part presentation explores Google’s: 1) Research on computer science (CS) education in the US, including awareness and perceptions among students, parents, and educators; disparities in access; and barriers to offering CS; and 2) CS First, a free Scratch-based program for grades 4-8 students, run by volunteers through after-school, in-school, and summer programs.

*Jennifer Wang, Ph.D., Program Manager, K-12 Education, Google*
*Amanda Sandler, Program Manager, CS First, Google*
Building an Ideal Playground: An Engineering Project-Based Learning Unit

Room #213B
Session ID: 241, Strand: 1, Grades: PK-2, Audience: E

A hands-on workshop showcasing an integrated Kindergarten Next Generation Science Standards-aligned unit incorporating engineering design. Content will include physical science force and motion, participating in shared research and writing, and asking questions for information. Participants will receive an in-depth overview of the project implementation process for 5-8 year olds.

Sherry Mohazab, Ed.D., Teacher and Technology Committee Chair, Playa Vista Elementary School
Shanon Albertson, Teacher and School Site Council Chair, Playa Vista Elementary School

#MakingMath: How to Facilitate and Integrate Making into Your Curriculum

Room #213C
Session ID: 389, Strand: 1, Grades: HS, Audience: E

Maker activities can unleash creativity and teach problem solving. Engage in a MakingMath lesson as a student and examine what procedures the facilitator used that led to success. Generate lesson ideas to bring back to classrooms.

James Town, M.Ed., Mathematics Specialist, Alameda County Office of Education - Core Learning Division
Francisco Nieto, EdTech Program Specialist, Alameda County Office of Education - Core Learning Division

Educating by Design

Room #213D
Session ID: 491, Strand: 2, Grades: HS, Audience: A

How do students learn science, technology, engineering, and mathematics in designed environments? How are learning processes and learning environments related? This discussion draws upon theories of development to illuminate a connection between classroom and facility design, and success in a high-quality STEM program.

Lauren Scranton, M.A., Director of Research and Development, NAC Architecture
Randall James, M.S., Director, North Central High School - Institute of Science and Technology

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Join facilitated conversations led by STEM educators and experts.
Each round will last 15 minutes. Attendees can participate in four different discussions during this session.

**Making Our Best Lessons Even Better**

**Table #1**
Lessons that meet the spirit of the National Research Council’s Framework for K-12 Science Education and the Next Generation Science Standards are already being implemented. Look at past successful lessons through the lens of these documents and make these good lessons even better.

Arthur Eisenkraft, Ph.D., Professor, University of Massachusetts, Boston

**Creative Play, Maker Education, and STEM: What is the Connection?**

**Table #2**
Come learn the explicit links between the Next Generation Science Standards, the Common Core State Standards, STEM, and the impact of hands-on learning. As an Imagination Foundation chapter, Schaefer Charter School puts learning into the hands of grades K-6 students. The benefits to students of creative play, Maker Education, and STEM are endless!

Gina Silveira, Principal, Piner-Olivet Union School District
Mary Reynolds, Principal, Piner-Olivet Union School District

**WestEd and Stanford’s Center for Assessment, Learning, and Equity (SCALE) Mathematics Assessment Literacy Toolkit**

**Table #3**
Experience the Building Educator Assessment Literacy Toolkit, which offers scored and annotated student work samples that capture meaningful teacher annotations and reflections, and insights into instructional strategies. This online resource develops your knowledge of Smarter Balanced performance tasks, measurement of the Common Core State Standards, and how to inform instructional practice.

MaBernadette Salgarino, Ed.D., Mathematics Coordinator, Santa Clara County Office of Education
Donna Lionne, Mathematics Coach, Temecula Valley Unified School District

**Time Will Tell: Time-Lapse Photography and Digital Storytelling to Observe Change**

**Table #4**
Observation of slow-moving events in time can be described using time-lapse photography and narrated using digital storytelling techniques. Explore methods, equipment, and applications with resources and samples provided.

Roger Pence, Teacher, Benicia Unified School District
Combining Novels with Science to Create Curriculum
Table #5
Get ideas for how to convert novels into STEM and Common Core State Standards (CCSS) curriculum. See an example of a teacher’s kit from an adventure novel that students love to read with engaging science concepts and fun projects that address the CCSS, too. Visit sydblue.com/product/stem.

Syd Blue, Author, sydblue.com
Tracy Tokunaga, Teacher, Big Bear Middle School

Build and Control Circuits with Arduino Code
Table #6
Build simple circuits in this interactive, hands-on session with breadboards, LEDs, and buzzers, using an Arduino microcontroller to control everything. The lesson plan shared has been used with success by over 500 sixth graders being taught about electricity, text-based coding, and physical computing. Arduino is a low-cost open source platform.

Sheena Vaidyanathan, Computer Science Teacher, Los Altos School District

Planting the Seed: Growing and Cultivating a STEM Program
Table #7
Learn about hands-on modules coupled with Google Apps for Education (GAFE) tools while getting resources to put into practice immediately that are aligned with the Common Core State Standards and the Next Generation Science Standards, and based on the 4Cs and 5Es offering pedagogy to support students’ access to 21st-century skills. STEM student notebooks are included.

Andrea Brown, M.A, Science, STEAM, Science Olympiad Curriculum and Instruction Teacher On Special Assignment, Hacienda La Puente Unified School District
Robert Yamasaki, STEM/Makerspace Teacher, Hacienda La Puente Unified School District

Analyzing Student-Collected Data with Python
Table #8
Using real data from student experiments on a high-altitude balloon, this demonstration of the basics of analyzing data with Python shows how to deal with missing or incomplete data, change data frequency, determine averages, visualize, and apply basic statistical analysis using the tools of choice for scientists.

Ben Peters, Director of Engineering, Ardusat

Icons Improve Student Understanding of Crosscutting Concepts
Table #9
Learn hands-on practices showing grades K-5 educators how the effective use of icons and their descriptions can help students better apply the Next Generation Science Standards Crosscutting concepts. Maria Blue is a member of the California Science Framework Committee.

Maria Blue, Teacher, Saugus Union School District - Emblem Academy
Robotics in the Elementary Classroom

Table #10
Robotics requires students not only to use computational thinking and engage in the engineering design process, but also brings the Common Core State Standards and the Next Generation Science Standards alive with creative working models. Get sample lessons and leave ready and excited to implement robotics in elementary classrooms.

Stephanie Anastasopoulos, STEM Integration Coach, Solana Beach School District

Amazing Learning Module - Wrong Grade Level: Upgrade Your Lesson

Table #11
Gain an introduction to a method to upgrade lessons and learning modules developed for lower grades into higher grades. Focus will be on open-ended, hands-on, authentic STEM project-based learning. Learn to use components of current lesson plans and learning modules for later grades.

Johannes Strobel, Ph.D., Professor and Director, University of Missouri
Sara D. Moore, Director of Mathematics and Science, ETA hand2mind

Improve Diversity and Equity with Transfer-Bridges for Problem Solving

Table #12
In five stages of instruction beginning with non-STEM inquiry, learn how to show students that almost everything in life, including engineering and science, uses a similar creative and critical problem-solving process, which may help more students, across a wider diversity, improve confidence and motivation for STEM.

Craig Rusbult, Ph.D., Curriculum Developer and Retired Teacher, University of Wisconsin

Encouraging Girls in STEM

Table #13
Examine the urgent need for women in STEM and equity issues in STEM. Discover research-based methods of encouraging girls to take higher level math and science classes in high school, major in STEM fields in college, and pursue STEM careers.

Nancy Brown, M.A., Teacher, California Academy of Mathematics and Science (CAMS)

The Influence of School Context on Elementary Science Instruction

Table #14
Hear findings from a National Science Foundation-funded study investigating long-term impacts of professional development on grades K-2 science teaching. Researchers examine how school contextual factors influenced participating teachers’ instructional decisions several years after professional development ended. The findings hold practical implications for sustaining inquiry-based science instruction over the long term.

Judith Sandholtz, Ph.D., Professor, University of California, Irvine
Cathy Ringstaff, Ph.D., Senior Research Associate, WestEd
No-Cost Online Tools for Exploring STEM Occupations

Table #15
Get an overview of California Career Resource Network (CalCRN) resources. CalCRN’s online and mobile career exploration resources can assist students in discovering and exploring STEM-related occupations. Participants will take away a broad understanding of CalCRN resources and how to begin using them with students immediately.

*John Merris-Coots, M.S., Education Programs Consultant, California Department of Education*

Building the STEAM Shop: Makerspaces in Public Schools

Table #16
Learn how Palisades Charter High School built Makerspaces and tackled fundraising, tool safety, curriculum innovation, and the University of California requirements, while working directly with local institutions of higher education to bridge the gap between student curiosity and STEAM careers. Gain insight into how these experiences can support change STEAM at your school.

*Donna Mandosa, Technology Director, Palisades Charter High School*
*Pamela McGee, Ed.D., Executive Director, Palisades Charter High School*

Blended STEM Learning Methods

Table #17
Hear how focusing on technology and space science with blended STEM methodologies in astronomy, geology, propulsion, and sensors motivates STEM learning of middle and high school students. Providing mentoring and tutoring, plus sharing role models in the STEM fields of space science and technology with students and parents, leads to career pathways in STEM.

*Bettye Walker, President/CEO, A-MAN Inc., STEM International Science Center*

STEM Learning in Transitional Kindergarten

Table #18
University faculty involved in a transitional kindergarten project will share insights about preparing teachers for supporting young children's STEM learning. Professional learning experiences focus on developmentally appropriate practice and ensuring children have plentiful opportunities for exploration, interaction with others, and choice. Resources from various professional organizations will be shared.

*Hallie Yopp, Ph.D., Professor, California State University, Fullerton*
*Kimberly Norman, Ph.D., Professor and Department Chair, California State University, Fullerton*

Make Graphing Fun Using Desmos Art and Whole Body

Table #19
Participate in hands-on demonstrations of free online programs such as www.desmos.com to create student art using graphs of linear and other algebraic equations. Also, use simple materials like a bed sheet and markers to make graphing interactive and fun for all grade levels while incorporating creative dance moves just for fun.

*Timothy Kim, Math Teacher, Learn4Life Schools*
*Karl Romero, Curriculum Specialist, Learn4LifeSchools*
Learn how our Teaching, Learning, Communications and Engagement solutions for K-12 offer the latest academic and communication tools to help your STEM program go mobile, meet common standards, and make the digital transformation.

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Introduction

Blair Blackwell
Manager, Education and Corporate Programs, Chevron

As the Manager of Education and Corporate Programs at Chevron Corporation, Blair Blackwell is responsible for leading Chevron’s education focused social investment initiatives in the United States. She has over 15 years of experience with the private sector, nonprofit organizations, and international organizations in Africa, the Balkans, Central Asia, and the United States. Previously, she served as director of private sector initiatives for the International Crisis Group and executive director of Princeton in Africa. She earned a bachelor’s degree in Slavic Languages and Literatures from Princeton University, and is a Term Member of the Council on Foreign Relations.

Keynote Speaker

Ainissa Ramirez, Ph.D.
Author & Science Evangelist

Ainissa G. Ramirez, Ph.D. is a science evangelist who is passionate about getting the general public excited about science. She co-authored Newton's Football: The Science Behind America's Game (Random House); and, authored Save Our Science: How to Inspire a New Generation of Scientists (TED Books).

Prior to being on the faculty at Yale, she was a research scientist at Bell Laboratories, Lucent Technologies, in Murray Hill, New Jersey were she did award-winning research. She has authored more than 50 technical papers, holds six patents, and has presented her work worldwide.

She now focuses her energies on making science fun, and gave an impassioned called to action at TED on the importance of understanding science, technology, engineering, and math (STEM), which generated widespread enthusiasm. She has served as a science advisor to the American Film Institute, WGBH/NOVA, the American Association for the Advancement of Science (AAAS), and several science museums.

Topic: Our Sputnik Moment in STEM Education

It wasn’t long ago Sputnik launched into the Russian sky galvanizing America to reexamine its commitment to science education. Today, we need a similar recommitment to STEM as evidenced by our international testing scores. Yet, these numbers have not the same reaction as Sputnik. We face bigger issues. Those who do STEM do not reflect the demographics of our nation - we are not tapping into all the talent needed to solve 21st-century problems. The emergence of new technologies (nanotechnology) require citizens be aware of the impact of such innovations—for good and bad. Ainissa Ramirez will make an impassioned call to action for science educators to get in touch with their inner superhero to help save STEM education. She will discuss the importance of STEM, fascinating work in nanotechnology, and will illuminate why science teachers are key not only to improving science literacy but also to sustaining democracy.
Engineering Success for “Thrice Exceptional” Students: STEM and Autism
Room #201A
Session ID: 40, Strand: 6, Grades: HS, Audience: A

“Thrice exceptional” students, including those with autism, are bright and engaged, have social and learning differences, and have an aptitude and a passion for STEM-related activities. Developing these skills throughout their school career promotes vocational success upon graduation. A discussion of behaviors and management of behaviors will be presented.

Ellis Crasnow, High School Principal, STEM3 Academy

Educators Working with Industry to Create Alternative STEM Success Pathways
Room #201B
Session ID: 430, Strand: 3, Grades: HS, Audience: E

Designed by San Diego’s Mathematics, Engineering, Science Achievement (MESA) Schools Program and Solar Turbines, the Solar’s Young Women Academy (SYWA) creates alternate pathways to STEM career opportunities for at-risk high school families. SYWA provides technical and life skills necessary for a career in the STEM industry while diversifying the STEM workforce.

Theresa Garcia, M.A., Assistant Dean of Student Affairs, San Diego State University College of Engineering

Race, Learning Attitudes, and Achievement: An Inequitable Triad
Room #201C
Session ID: 223, Strand: 6, Grades: HS, Audience: C

Learn engaging details from this 12-year, nationally representative, longitudinal study investigating the relationship between developing psychosocial learning attitudes, race, and academic achievement in mathematics for high school students in the United States.

James Martinez, Ed.D., Lecturer and Field Supervisor, California State University, Channel Islands

Engineering Design Resources for Educators and Families
Room #201D
Session ID: 552, Strand: 5, Grades: MS, Audience: E

Developed by Boeing engineers and leading partners such as Teaching Channel, PBS LearningMedia and Iridescent, our free K-12 educational resources provide hands-on, problem-based learning opportunities to help your students apply classroom knowledge in real and relevant ways. Learn about video profiles, interactive learning modules, family and teacher guides, and online engineering design challenges. Plus the Curiosity Machine: an online community of learning by doing where families and educators can work toward solutions with the online support and guidance of scientist and engineer mentors.

Tara Chklovski, Founder & CEO, Iridescent Learning
Tamika Lang, Global Corporate Citizenship Western Region Manager, Boeing

Extreme Home Makeover, Environmental Edition: Engineering Design Project Using Data
Room #202A
Session ID: 197, Strand: 1, Grades: HS, Audience: E

Use Google Earth, design software, and current local data, to interactively design an eco-conscious house guided by environmental science knowledge and the Next Generation Science Standards performance expectations. Interact with multiple engineering tasks to inform decisions and present a final proposal to the “city” for approval.

Whitney McCormick, M.A., Director, Science Instruction, Alliance College-Ready Public Schools
Engaging Education and Industry Partners to Advance STEM Access for Students

Room #202B
Session ID: 285, Strand: 6, Grades: HS, Audience: O

The North Central Valley STEM Center became the 10th Regional Network of the California STEM Learning Network in 2014 and hasn't looked back since! Hear our educational and industry partners share insights about the STEM Center’s quest to provide STEM opportunities for all students.

Bret States, STEM Coordinator, San Joaquin County Office of Education
Michael Cardenas, Engineering Manager, National Securities Technologies

EnCorps STEM Teachers: “What You Do with Experience Counts”

Room #203A
Session ID: 13, Strand: 5, Grades: HS, Audience: C

The EnCorps STEM Teachers Program recruits, selects, and develops the best and brightest STEM professionals and military veterans, as an innovative, long-term solution to the shortage of high-quality, impactful STEM educators for under-resourced students in high-need communities.

Katherine Wilcox, Executive Director, EnCorps STEM Teachers Program
Bethany Orozco, Southern California Program and Recruitment Director, EnCorps STEM Teachers Program

Engineering a Sustainable Future for Your Students

Room #203B
Session ID: 257, Strand: 1, Grades: 3-5, Audience: E

Experience PEAK Student Energy Actions, an environmental education program designed to empower students with the knowledge to manage energy consumption. Join the PEAK team in an interactive lesson designing an energy-efficient aircraft. Gain a deeper understanding of how energy demand, usage, and renewable resources are important factors in achieving a net-zero sustainable future.

Laura Divine, M.A., Project Manager, The Energy Coalition (PEAK Program)
Kevin Figueroa, Project Manager, The Energy Coalition (PEAK Program)

Computer Science Access for Students of Color: Disparities and Opportunities

Room #204A
Session ID: 281, Strand: 6, Grades: HS, Audience: E

Only 13 percent of California’s public high schools offer Advanced Placement Computer Science, with additional disparities affecting African-American, Latino, and low income students. Examine inequitable access to computer science courses and discuss actions participants can take to broaden participation in computing for all students.

Alexis Martin, Ph.D., Director of Research and Evaluation, Level Playing Field Institute

How to Link Classrooms to Business and Industry

Room #204B
Session ID: 506, Strand: 5, Grades: HS, Audience: E

Educators will learn from a panel of experts the key elements in successful business and industry partnerships. This panel discussion will inspire local educational agencies to begin or expand partnerships with employers in order to provide high-quality learning experiences for students in a variety of ways including: quality work-based learning experiences, mentoring, educator internships, and industry experts in the classroom.

Moderator: Darrell Steinberg, Legislative Author, California Career Pathways Trust
Panelists: Linda Collins, Executive Director, Career Ladders Project; Noemi Donoso, Senior Vice President, Education Initiatives, Roll International Corporation; Ed Hidalgo, Senior Director Staffing, Qualcomm; Anette Smith-Dohring, Workforce Development Manager, Sutter Health
Bring STEM to Your School: STEM Clubs in Action

Room #204C
Session ID: 145, Strand: 3, Grades: HS, Audience: E
Discuss how to start a successful after school STEM program with limited funding. Ideas for getting funding, successful club meetings, and a community STEM night will be discussed.

Lauren Petersen, Science Teacher, Sweetwater Unified High School District - Montgomery High School
Nina Hermosillo, ASSETS Program Coordinator, Sweetwater Unified High School District - Montgomery High School

STEAMing Our Way to Success: What Schoolwide Implementation Looks Like

Room #205A
Session ID: 284, Strand: 1, Grades: 3-5, Audience: E
Learn how to plan and implement cross-curricular units, including scientific inquiry, instructional strategies, and comprehensive projects, for grades 1-5 that maximizes success for all students, especially English Learners, through STEAM integration.

Jessica Newkirk, M.Ed., Teacher, National School District Acres
Jackie Ma, M.Ed., Teacher, Lincoln Acres

Supporting After School Youth with Common Core State Standards for Mathematics

Room #205B
Session ID: 444, Strand: 3, Grades: MS, Audience: O
Engage in hands-on activities to learn key ideas in the Common Core State Standards for Mathematics to support after school students in grades K-12 as they transition into assignments that require greater conceptual knowledge and understanding of academic vocabulary using example problems that reflect the eight Mathematical Practices.

David Tong, Senior Manager, Student Support Services, Tiger Woods Foundation

STEM Certificate for Educators

Room #206A
Session ID: 480, Strand: 1, Grades: P, Audience: E
The STEM Certificate for Educators offered through California State University, San Bernardino is a masters’ level program with emphasis on problem-based, hands-on learning applications, the Common Core State Standards and the Next Generation Science Standards, including hard and soft employability skills.

Wendy Zinn, Project Manager, San Bernardino Community College District
Carlos González, Director, UCR/BCOE MESA Program, University of California, Riverside, Bourns College of Engineering

Engineering Technology: Project-Based Learning for All Students!

Room #206B
Session ID: 359, Strand: 1, Grades: HS, Audience: E
See a course in which students of all levels work together to design and create projects like a smart house, a solar-powered vehicle, or a hovercraft. Incorporating facets of engineering, including robotics, machining, pneumatics, and welding, while promoting soft skills like teamwork and communication, students experience the entire design process from idea to prototype.

Joseph Russo, Teacher, Beaumont High School
Where to Start? Building and Implementing a STEM Program

Room #207A

Session ID: 380, Strand: 5, Grades: MS, Audience: E

Learn how to successfully network, harness educational passion, and build a STEM program that engages all students through a step-by-step guide to initiating, building, and assessing the program using community connections, place-based education, and local promotion.

Nate Haston, STEM Instructor, Bear Valley Unified School District
Dena Arbaugh, Principal, Big Bear Middle School

Do You See What I See?

Room #207B

Session ID: 175, Strand: 6, Grades: 3-5, Audience: E

Consider the issue of unintentional exclusion of girls within STEM-focused areas in a hands-on workshop that focuses on science concepts associated with the senses and perception. Research-based information and storylines introduce examples of unintentional gender bias and the interactive activities model how to plan engaging, gender-neutral and inclusive science lessons.

Janet Yamaguchi, Vice President, Education, Discovery Cube OC and LA

Social Studies, English/Language Arts, and STEM - Oh My: Integrating It All!

Room #207C

Session ID: 150, Strand: 1, Grades: 3-5, Audience: E

STEM goes beyond just science, technology, engineering, and mathematics; it is a way to problem solve with real-world applications. See how the Los Altos School District is integrating all subjects into STEM through Project-Based Learning and design challenges that focus on curriculum and the Next Generation Science Standards.

Karen Wilson, M.Ed., STEM Coach, Los Altos School District
Elizabeth Leach, STEM Teacher, Los Altos School District

Intentional Leadership Through E-Colors

Room #207D

Session ID: 37, Strand: 2, Grades: HS, Audience: E

Learn about the Taft Oil Technology Academy’s program for developing individuals to become intentional leaders, reflective communicators and valued members of society utilizing E-Colors and Personal Intervention, including additional groundbreaking applications.

Ted Pendergrass, Coordinator, Taft Oil Technology Academy
Rosalinda Mercado-Garza, CEO, E-Colors in Education

Transition with Ease: Next Generation Science Standards and Common Core State Standards

Room #208A

Session ID: 377, Strand: 1, Grades: PK-2, Audience: E

Join this interactive session that provides strategies, planning tools, and resources to successfully and easily transition into the Next Generation Science Standards (NGSS), while integrating current Common Core State Standards. Participants will experience a 3-D science lesson that incorporates NGSS practices, Cross-Cutting Concepts and an interactive science notebook.

Gretchen Bazela, Senior Director of Education, California Science Center
Shannon Cabrera, Teacher Specialist, California Science Center
Do You See What I See? Making Student Thinking Visible
Room #208B

Session ID: 251, Strand: 1, Grades: HS, Audience: E

Come see modeling in action. Participants will engage in several Next Generation Science Standards modeling activities. All participants will leave with a “grab bag” of lesson plans and strategies that can be implemented in their classroom as soon as they return from the conference.

Samantha Johnson, Science Teacher, San Lorenzo Unified School District
Jim Clark, NGSS Coordinator, San Lorenzo Unified School District

Creative Arts+STEM Collaborations: Effective Tools to Build a STEAM Program
Room #209A

Session ID: 292, Strand: 4, Grades: MS, Audience: A

This program showcase will highlight examples of how the arts provide a unique experience for STEM learning while demonstrating tips and tools to incorporate STEAM. Three STEAM leaders from the STEAMConnect Network who are successfully combining the arts and STEM through their school and/or organization will provide diverse ways to incorporate STEAM.

Kim Richards, Founder, KDR PR + STEAM Insight
Denise Grande, Director of Arts Education, Arts for All

Mi Familia: Three Mexican Engineering Sisters
Room #209B

Session ID: 133, Strand: 6, Grades: P, Audience: C

As the current STEM coordinator at Reedley College, the presenter will share her journey, which includes obtaining a doctoral degree in Environmental Science and Engineering while being a full-time mother. She will also share the accomplishments of her sisters as Hispanic engineers.

Brissa Quiroz, Ph.D., STEM Coordinator, Reedley College

STEM to Story: Creative Writing and Hands-On STEM
Room #210A

Session ID: 365, Strand: 4, Grades: MS, Audience: O

A creative writing program, 826 National, and STEM educators developed writing prompts paired with hands-on STEM activities that promote creative expression, literacy, and STEM engagement in innovative ways. Hear about lessons, best practices, and activities educators can use now.

Carol Tang, Executive Director, Children’s Creativity Museum
Julius Diaz-Panoringan, Director of Education, 826LA

Crime Scene Investigation and Mock Trial: STEM Across the Curriculum
Room #210B

Session ID: 52, Strand: 1, Grades: MS, Audience: E

Collect the tools to create a cross-curricular unit focused on crime scene investigation/forensic process and mock trial. Foster readiness for college or career with a Project-Based Learning unit that includes forensic investigation, script writing, analysis of findings, evidence, the justice system, and newspaper/media writing and reporting.

Kelly Skon, District Coordinator of Secondary STEM, Saddleback Valley Unified School District
Michelle Martinez, Teacher, Laguna Beach Unified School District
Developing High School Leaders to Support Middle and Elementary School Robotics Programs

Room #210C

Session ID: 271, Strand: 2, Grades: HS, Audience: A

This presentation offers ideas for helping build high school mentors to support middle school and elementary robotics programs. The goal of this program is to develop mentors and volunteers to sustain competitive robotics programs throughout a school district.

Cari Williams, M.S., Digital Learning Coach, Tustin Unified School District

Crossing Disciplines with Social Media

Room #210D

Session ID: 274, Strand: 1, Grades: HS, Audience: E

Learn how to bring social media into the classroom with KQED’s Do Now project to excite high school students about current STEM topics. Students broaden critical thinking, literacy, and communication skills by sharing their thoughts, responding to each other’s ideas, and gathering evidence to engage in discussion.

Andrea Aust, M.A., Science Education Manager, KQED

How Leading California Women Address the Gender Gap in STEM Majors and Careers

Room #211A

Session ID: 179, Strand: 6, Grades: MS, Audience: E

Enrollments in the STEM fields of technology and engineering in colleges continue to reflect girls’ perception that engineering coursework, along with other STEM disciplines, are for boys. Women leaders in science, engineering, and informal education identify effective programs that promote girls’ sense of belonging in all STEM disciplines.

Susan Belgrad, Ed.D., Professor, California State University, Northridge
Ota Lutz, Ph.D., Education Specialist, JPL NASA

A Window into Next Generation Science Standards Implementation and District Needs

Room #211B

Session ID: 103, Strand: 2, Grades: MS, Audience: A

This workshop provides a Next Generation Science Standards (NGSS) implementation toolkit, such as observation tools and protocols, intended to help identify the structures and supports needed to implement NGSS in school districts. Participants will observe a classroom video, experience the tools, and explore how to identify professional development supports.

Dawn O’Connor, M.A., Director, Science, Alameda County Office of Education
Leena Bakshi, Ed.D., Science Coordinator, Science Partnership, Alameda County Office of Education

Start Your Engines: Engaging Early Learners with Science Practices

Room #212A

Session ID: 169, Strand: 1, Grades: PK-2, Audience: E

This hands-on workshop focuses on developmentally appropriate activities that engage early learners in STEM. Explore how the alignment of the California Preschool Learning Foundations science domain and the Next Generation Science Standards science practices provide opportunities for engagement of young scientists in creative problem-solving and critical thinking skills while exploring STEM concepts.

Hilary Dito, STEAM Coordinator, Contra Costa County Office of Education
Eloisa Mendoza-Hinds, English Learner Lead, Contra Costa County Office of Education - Bay Region 4 CPIN
A Natural STEM Fit: Global Learning and Observations to Benefit the Environment and Next Generation Science Standards
Room #212B
Session ID: 490, Strand: 3, Grades: HS, Audience: E
Learn how to get your students excited about developing science investigations in and around their school. Participants learn the Global Learning and Observations to Benefit the Environment (GLOBE) international program while experiencing activities and protocols from the teacher’s guide.
Henry Ortiz, M.S., Instructional Coach, Los Angeles Unified School District

STEM, Next Generation Science Standards, and Kindergarten
Room #213A
Session ID: 225, Strand: 1, Grades: PK-2, Audience: E
This session utilizes the Next Generation Science Standards as a base to provide STEM activities in early grades. Through the Science and Engineering Practices, teachers will leave this session able to create highly interactive lessons for their youngest students.
Casaundra McNair, Ed.D., Principal, Moreno Valley Unified School District
Lizbeth Magallanes, M.A., Teacher, Moreno Valley Unified School District

Building Sustainable Change in STEM Instruction
Room #213B
Session ID: 286, Strand: 2, Grades: HS, Audience: A
Wondering how to support your teachers in shifting their practices to implement the Common Core State Standards for Mathematics and the Next Generation Science Standards? This interactive session demonstrates how the Center for Math and Science Teaching (CMAST) at Loyola Marymount University used teacher leadership to build capacity in over 50 school sites throughout eight districts in five years.
Michael Castiglione, M.S., Program Director of Teacher Leadership, Loyola Marymount University
Lindsay Uribe, M.S., Clinical Faculty, Loyola Marymount University

Beyond Getting It Right! Fostering Mathematics Understanding in the Classroom
Room #213C
Session ID: 129, Strand: 1, Grades: MS, Audience: E
Getting the right answer to a problem is good, but students are encouraged to justify and explain why their answer is mathematically sound. Experience purposeful tools and protocols that support students as confident practitioners and communicators of mathematics. This presentation discusses strategies that support all students through rich mathematical tasks, vocabulary development, and discourse.
MaBernadette Salgarino, Ed.D., Mathematics Coordinator, Santa Clara County Office of Education
Cecilio Dimas, STEAM Director, Santa Clara County Office of Education

Creating Integrated STEM Projects Across the Core
Room #213D
Session ID: 94, Strand: 1, Grades: HS, Audience: E
Academic teams look at examples and discuss integrated projects that can be applied so students can complete a piece of the project in each course, accomplish the standards of that course, and create a truly integrated project. Teachers discuss the project, the components, the calendar, and the capstone presentations.
Kevin English, Instructional Manager, National Academy Foundation
HERE ARE JUST SOME OF THE PROGRAMS YOU’LL FIND AT PUBLIC LIBRARIES:

- Afterschool STEM Programming
- Maker Spaces
- Robotics Workshops
- Teen Digital Literacy
- Homework Help
- 3-D Printers
- Books that support Common Core homework assignments

Programs are funded by federal grants managed by the Institute of Museum and Library Services and administered by the California State Library.
Outside-In: Drivers of Highly Effective After School and Summer STEM Learning  
**Room #201A**  
**Session ID: 310, Strand: 3, Grades: MS, Audience: E**  
Explore drivers of effective after school and summer STEM learning. The exemplary programs featured have key attributes of success. Each are: (a) cross-disciplinary, (b) college and career standards focused, (c) challenging, and (d) cutting-edge. They reflect partnerships between universities and K-12 schools, Boys and Girls Clubs, and science museums.  
Joan Bissell, Ed.D., Director, Teacher Education and Public School Programs, California State University  
Jesse Lovejoy, M.A., Museum and Center Director, San Francisco 49ers

Ten STEM Foundations Needed for Implementation  
**Room #201B**  
**Session ID: 372, Strand: 2, Grades: HS, Audience: A**  
What is STEM education? Robots in the classroom? A school garden? Long-term projects? A STEM program contains many programmatic components. Learn the ten foundations to build a successful STEM program.  
Lou Randall, STEAM Coordinator, Val Verde Unified School District  
Michael McCormick, Superintendent, Val Verde Unified School District

Celebrating Women in Mathematics and Science: A STEM Culture  
**Room #201C**  
**Session ID: 497, Strand: 6, Grades: P, Audience: O**  
Celebrate ten years of Women in Mathematics and Science (WIMS), a program San Bernardino Valley College developed to share success through STEM careers to hundreds of young women. Using alliances with many stakeholders, WIMS removes cultural boundaries and stereotypes about women in STEM through hands-on activities in cybersecurity, engineering, and mathematics.  
Henry Hua, Dean-Mathematics, Business, Computer Information Technology, San Bernardino Valley College  
Marc Donnhauser, HSI STEM Pass-Go/Student Success Center Project Director, San Bernardino Valley College

Mathematics Educational Equity Through Family Engagement  
**Room #202A**  
**Session ID: 79, Strand: 6, Grades: 3-5, Audience: C**  
Educational equity requires authentic involvement of family and community. Explore key principles of family and community engagement, learn about outreach initiatives supported by the Alameda County Office of Education, and begin planning to involve stakeholders at the site level to ensure that all young people achieve academic success.  
Celine Liu, M.S.W., Mathematics Specialist, Alameda County Office of Education  
Juwen Lam, M.A., Co-Interim Director, Alameda County Office of Education

STEM as a 24/7 Role Play Game  
**Room #202B**  
**Session ID: 489, Strand: 1, Grades: HS, Audience: E**  
Wildwood School’s “role-play game,” Wildwood Institute for STEM Research, is a student-created and directed institute that makes students into scientists, engineers, mathematicians, and graphic artists who complete independent research, provide lectures, publish a journal, maintain a Web page, and present at conferences. Currently, there are three spinoffs from the research.  
Joe Wise, M.A., STEM Coordinator, Wildwood School  
Dylan Vecchione, Director, Wildwood School
Hack Your Classroom: Building an Equitable Lab on a Budget  
**Room #203A**

**Session ID: 263, Strand: 6, Grades: HS, Audience: E**

An equitable lab is more realistic than you might imagine. Learn to transform cupboards of antique sensors, out-of-date computers, and canned labs into recycled and repurposed resources, labs built for tinkering, and students who build their own futures.

*Ryan Hays, Science Teacher, Perris Union High School District - Perris High School*

Adding Art to STEM with Levers, Balances, and Mobiles  
**Room #203B**

**Session ID: 12, Strand: 4, Grades: MS, Audience: E**

Learn to incorporate art into a STEM lesson by making Calder-inspired mobiles from simple materials, while using computers and 3-D printers. The STEM lesson includes calculating the placement of mobile pieces using levers and balances and is based on the masses and distance from the fulcrum of the pieces.

*Helen Hixon, STEM Teacher, Beverly Hills Unified School District  
Angela Brizuela, STEM Teacher, Beverly Hills Unified School District*

Free Online and Mobile Tools for Exploring STEM Careers  
**Room #204A**

**Session ID: 194, Strand: 3, Grades: HS, Audience: E**

This session will provide an overview of the California Career Resource Network (CalCRN). CalCRN’s online and mobile career exploration resources can assist students in discovering and exploring STEM-related occupations. Participants will take away a broad understanding of CalCRN resources and how to begin using them with students immediately.

*John Merris-Coots, M.S., Education Programs Consultant, California Department of Education*

Design Challenges to Develop Critical Thinking and Grit  
**Room #204C**

**Session ID: 253, Strand: 1, Grades: MS, Audience: E**

Join Kathleen Fredette, NASA SOFIA Airborne Astronomy Ambassador and NASA Endeavor Fellow, as participants apply the engineering design process through NASA Design Challenges. Experience a design challenge that can be used the next day along with apps, NASA teacher curriculum, and metacognitive practices that encourage students to own their learning.

*Kathleen Fredette, STEM and Science Teacher, Palmdale School District*

GEMS in STEM: Girls - Engineering - Mathematics - Science  
**Room #205A**

**Session ID: 307, Strand: 6, Grades: HS, Audience: E**

See highlights from Cabrillo High School’s Girls, Engineering, Mathematics, and Science (GEMS) club in Long Beach. The GEMS will demonstrate their skills with various STEM technologies including robotics, laser art, advanced digital manufacturing, and 3-D printing.

*Steve Marsh, Career Technical Education Department Head/Project Lead The Way Instructor, Long Beach Unified School District - Cabrillo High School  
James Mills, M.A., Project Lead The Way Instructor, Long Beach Unified School District - Cabrillo High School*
LEGOs: Design Thinking and Engineering for Young Students
Room #205B

Session ID: 149, Strand: 1, Grades: PK-2, Audience: E

Join in the engineering activities aligned to the Next Generation Science Standards Engineering Practices using LEGO by participating in demonstrations showing how to scaffold design thinking for early learners and tie design thinking to the engineering process.

Lynn Reed, Makerspace Director, Bullis Charter School
Jessica Lura, Director of Strategic Initiatives and Partnerships, Bullis Charter School

Findings from the 2015 Power of Discovery: STEM2 After School Learning Initiative
Room #206A

Session ID: 49, Strand: 3, Grades: 3-5, Audience: O

The Power of Discovery: STEM2 Out-of-School time initiative improved after school STEM learning for youth in California. The evaluation uses staff and student survey data, documentation of activities, and professional development and observation data from up to 160 sites to produce findings that have implications to improve STEM Out-of-School learning.

Pilar O’Cadiz, Ph.D., Research Scientist, University of California, Irvine
Rahila Simzar, M.Ed., Doctoral Candidate, University of California, Irvine

STEM Is Everywhere!
Room #206B

Session ID: 500, Strand: 3, Grades: MS, Audience: O

Expanded Learning programs provide learners an opportunity to develop a STEM mindset. Explore how informal and formal STEM experiences are integral to our children’s education. See how the Next Generation Science Standards Framework model of the 5E’s are integrated within the STEM Ecosystem and examine hubs of innovation across the state.

Michael Funk, Director, After School Division, California Department of Education
Yvonne Evans, Education Programs Consultant, After School Division, California Department of Education

Tomorrow’s Scientists: After School Science Clubs for Middle School Students by Pre-service Teachers
Room #207A

Session ID: 232, Strand: 3, Grades: P, Audience: O

Learn how middle school and university students can be involved in science learning together. Explore how pre-service teachers may gain confidence in their teaching skills and content knowledge in science, while middle school students experience a university campus environment and enriching after school program in science.

Virginia Vandergon, Ph.D., Professor of Biology, California State University, Northridge
Brian Foley, Ph.D., Associate Professor of Education, California State University, Northridge

Junior Engineering and Technology in the K-2 Classroom
Room #207B

Session ID: 224, Strand: 1, Grades: PK-2, Audience: E

Junior Engineering and Technology is a program for grades K-2 that uses Project-Based Learning strategies to teach English-Language Arts and the Common Core State Standards with a focus on the Next Generation Science Standards. Learn how student teams work together to research and collaborate while solving problems.

Tess Toledo, Teacher, Sulphur Springs School District
Olivia Patino, Teacher, Sulphur Springs School District
Recruiting the Next Generation of STEM Teachers Through YouthTEACH2Learn

Room #207C

Session ID: 265, Strand: 5, Grades: HS, Audience: E

YouthTEACH2Learn is a high school class teaching students how to develop and teach mathematics and science lessons to elementary students. Presenters share the experiences of students, past and present, and review seven years of research on this program’s impact on student interest and motivation to pursue STEM teaching careers.

Gregory Nicholson, Ph.D., Director of Advancement, Project Tomorrow

KQED Art School: Arts and Media Integration Across STEM Subjects

Room #207D

Session ID: 199, Strand: 4, Grades: HS, Audience: E

Meet a sculptor who uses the periodic table to select materials, a painter who creates geometry-based designs, and more. Artists also demonstrate techniques that students can follow. KQED Art School is a free video series for students featuring contemporary artists who discuss their work, including STEM subject integration.

Kristin Farr, Arts Education Manager, KQED

Developing STEM in Middle Grades: Examples from California and Beyond

Room #208A

Session ID: 487, Strand: 1, Grades: MS, Audience: E

This session will use model strategies from middle grade STEM programs to identify key issues in STEM program design and development. The format will include virtual visits and a focus on creating a program that meets the developmental needs of students.

David Militzer, Educational Programs Consultant, Middle Grades, California Department of Education
Alisa McCord, Coordinator, STEM Partnership/CTE Initiatives, Orange County Department of Education

Creating Interdisciplinary Next Generation Science Standards-Focused Curriculum

Room #208B

Session ID: 217, Strand: 1, Grades: PK-2, Audience: E

What if students developed creative confidence through inquiry-based instruction? What if students weren’t afraid to make mistakes? What if this could happen within an interdisciplinary, Next Generation Science Standards-focused curriculum? Workshop attendees will leave with practical tools and techniques to develop a cohesive STEM program.

Katie Farley, M.Ed., STEM Teacher, Los Altos School District
Grace Choi, M.Ed., STEM Teacher, Los Altos School District

Integrating Engineering Design, Computational Thinking, and 21st-Century Skills

Room #209A

Session ID: 153, Strand: 6, Grades: HS, Audience: A

Engage diverse student populations using an innovative, research-based engineering curriculum in a course approved for A-G credit. Interactive discussions cover how Engineer Your World, developed with funding from the National Science Foundation, satisfies the Next Generation Science Standards for engineering while fostering computational thinking and 21st-century skills.

Cheryl Farmer, Program Director, Engineer Your World, The University of Texas at Austin
Igniting the Dream: Supports and Strategies to Diversify STEM Fields

Room #209B
Session ID: 495, Strand: 6, Grades: MS, Audience: E

Explore findings from a national research project focused on determining the predictive factors influencing and promoting diverse students to enter STEM fields in academia. Key findings, along with practical tools, will be presented for educators to provide culturally appropriate supports and strategies.

Lisceth Brazil-Cruz, Ph.D., Postdoctoral Researcher, University of California, Davis

High-Altitude Balloon Near Space Experiments

Room #210A
Session ID: 198, Strand: 1, Grades: HS, Audience: E

Ballooning allows students to act as scientists by designing, executing, and analyzing a research question of their design. Student teams learn to take responsibility for all aspects of their project. This workshop details how to incorporate high-altitude experiments into a variety of settings in a cost-effective manner.

Christine Hirst, Teacher, West Ranch High School

Planning Cross-Curricular STEM-Based Units

Room #210B
Session ID: 139, Strand: 1, Grades: MS, Audience: E

Example units presented with planning materials show the value and importance of interdisciplinary STEM-based units in middle grades. Participants will learn how to plan cohesive units, locate and create resources, and present material in an engaging, interactive manner.

Stacie Johnson, M.A., Teacher, Hanford Elementary School District

Middle School STEM

Room #210C
Session ID: 177, Strand: 2, Grades: MS, Audience: E

Interested in creating a STEM building or department in your school? This panel of STEM teachers and administrators created a successful and innovative STEM program for middle school students, featuring robotics, engineering, coding, flash animation, and the Make movement. Hear about best practices, failures, successes, and efforts to get community support, grow the programs, and get students engaged.

Lisa DeLapo, M.A., Assistant Director of Technology, Lafayette School District
Michael Meneghetti, M.A., Robotics & Engineering Teacher, Lafayette School District - Stanley Middle School

Exploring Next Generation Science Standards and Engineering Practices Using NextGen TARSC

Room #210D
Session ID: 422, Strand: 1, Grades: MS, Audience: E

Engage in using the National Science Foundation-funded NextGen TARSC toolkit to critically examine the Next Generation Science Standards Science and Engineering Practices in the context of three-dimensional learning in grades K-12 science lessons and instruction.

Corinne Lardy, Next Gen TARSC Project Assistant Director, Center for Science Education and Research, California State University, East Bay
Rachelle DiStefano, Director, Center for Science Education and Research, California State University, East Bay
**STEM Program: Read It! Build It! 2.0**

**Room #211A**

Session ID: 227, Strand: 1, Grades: 3-5, Audience: E

This hands-on learning session offers ideas for a variety of engineering challenges that directly correlate to K-5 literature and the Next Generation Science Standards engineering practices. Integrating engineering activities into your literacy units is a great way to reach all types of students.

*Joanie Craddock, STEM Educator, Los Altos School District*

*Alexandra Schroeder, M.Ed., STEM Educator, Los Altos School District*

**Real, Relevant, and Rigorous STEAM Integration**

**Room #211B**

Session ID: 180, Strand: 4, Grades: 3-5, Audience: E

Examine details of the teacher planning process and several successful projects demonstrating how to integrate STEAM into your existing Common Core curriculum. STEAM need not be an add-on, learn to make it a focal point.

*Julie Goo, M.A., STEAM Coach, Campbell Union School District*

*Amanda Haughs, Mathematics and Technology Integration Coach, Campbell Union School District*

**Capturing the Essence of the Next Generation Science Standards in the Physics Classroom**

**Room #212A**

Session ID: 248, Strand: 1, Grades: HS, Audience: E

Learn how to implement STEM and Next Generation Science Standards in your Physics, Physics First, and/or Physical Science classroom with help from former National Science Teachers Association president, Arthur Eisenkraft. Gain an understanding of the benefits of the embedded engineering design cycle. Discover how involving students in innovative, Project-Based Learning can increase student performance.

*Arthur Eisenkraft, Ph.D., Professor, University of Massachusetts, Boston*

**STEM Leadership at the County and District Level**

**Room #212B**

Session ID: 254, Strand: 2, Grades: MS, Audience: A

County Offices of Education can play an important role in the leadership and facilitation of STEAM programs spanning across multiple school sites and districts. Come and hear how one county office is working with an Institute of Higher Education to provide long-term, STEM-based professional development to teachers and administrators.

*Jacqueline Kearns, Ed.D., Program Manager: Accountability, Assessment, and Instructional Technology, Solano County Office of Education*

*Sandy Jessop, M.Ed., Assistant Superintendent, Solano County Office of Education*

**Linking the Classroom to the Community**

**Room #213A**

Session ID: 158, Strand: 5, Grades: MS, Audience: C

Imagine the potential of linking 113,852 middle school students with 22,700 STEM professionals in Orange County, California. Discover the exciting and innovative ways Science@OC engages the resources of the community and explore options that focus on the critical link between the classroom and STEM careers.

*Sue Neuen, M.S., Executive Director, Science@OC*

*Anna Solis, Fluor Corporation*
Building a Standards-Based Unit with Next Generation Science Standards and Common Core State Standards

Room #213B
Session ID: 215, Strand: 1, Grades: PK-2, Audience: E

Learn how to build a standards-based unit with the Common Core State Standards and the Next Generation Science Standards. Starting with phenomena, adding literature and mathematics, and using three-dimensional science learning, build an instructional unit your students will never forget. Presenter worked on the new California Science Framework.

Maria Blue, Teacher, Saugus Union School District - Emblem Academy

Generating a Spark for Learning with STEM

Room #213C
Session ID: 88, Strand: 1, Grades: 3-5, Audience: E

Focusing on empowering grades K-6 teachers with the needed background and resources to successfully implement exciting unit launch activities in their elementary classrooms, this hands-on workshop includes 10 simple and inexpensive Next Generation Science Standards and Common Core State Standards-aligned activities, including full lesson plans and handouts, providing teachers with valuable classroom-ready resources.

Stephanie Anastasopoulos, STEM Integration Coach, Solana Beach School District
Gina Thackrey, STREAM Teacher On Special Assignment, Solana Beach School District

Needle in the Haystack: Picking High-Quality STEM Curriculum

Room #213D
Session ID: 335, Strand: 2, Grades: 3-5, Audience: A

Join an interactive session in which we introduce tools for picking a high-quality STEM curriculum. Presenters will share a rubric and examples to make an informed decision on choosing from the many existing curricula.

Johannes Strobel, Ph.D., Professor and Director, University of Missouri
Sara D. Moore, Ph.D., Director of Mathematics and Science, ETA hand2mind

We want your feedback!

Please complete the session and Symposium surveys. For each survey completed, you increase your chances of winning a prize!
Join facilitated conversations led by STEM educators and experts.
Each round will last 15 minutes. Attendees can participate in four different discussions during this session.

Assessing the Three Dimensions of the California Next Generation Science Standards with Performance Expectation Assessment Tasks (PEATs)
Table #1
Learn the process of developing Performance Expectation Assessment Tasks (PEATs), evaluation assessments developed for the California Next Generation Science Standards and focused on student engagement in Scientific and Engineering Practices using the Crosscutting Concepts in understanding the Disciplinary Core Ideas. Receive full assessment instruments and how to apply them.

*Jarrett Whitaker, Director, Rice Digital Learning and Scholarship, Rice University*

Ignite Curiosity in STEM with PBS LearningMedia
Table #2
Experience a quick tour of the newly expanded PBS LearningMedia, a robust media library of more than 100,000 videos, interactive games, and lessons. See examples of PBS productivity tools effectively integrated into personalized learning experiences.

*Almetria Vaba, Project Manager, Education, KQED*

Learn to Code
Table #3
Gain insight into creative computing with MIT’s Scratch programming tool, using a design-based learning approach. As the new literacy, coding gives students the necessary tools to thrive in the 21st Century by using the 4Cs: Critical Thinking, Creativity, Collaboration, and Communication.

*Gregory Beutler, Director, TechsCool*

Phenomenal Lesson Design: Planning Science Lessons the Next Generation Science Standards Way
Table #4
Interact with a Next Generation Science Standards-centered template to plan phenomenon-based science lessons that support all students. Explore research-based strategies and put ideas into practice with specific examples. Sample lessons and tools to help with planning will be shared.

*Sara Dozier, Science Coordinator, Alameda County Office of Education*

Geographic Information Systems (GIS) in the Classroom
Table #5
Get an introduction to geographic information systems (GIS), which are designed to collect, integrate, and analyze multiple types of spatial or geographical data. Focusing on ESRI’s ArcGIS mapping software, the demonstration includes ideas for using GIS in a middle school classroom.

*Darlene Pitman, M.A., STEM Teacher, Mesa View Middle School
Kim Terry, M.A, STEM Coordinator, San Bernardino County Schools’ Alliance for Education*
**Hazards from Space: Space Debris and Asteroids**

**Table #6**

See a demonstration of an online, near-Earth asteroid deflection app developed for NASA using simulated earthbound asteroids to design deflection missions, causing the asteroid to miss Earth. Gain insight into the challenges involved with deflection of hazardous near-Earth space objects. See Web link at: neo.jpl.nasa.gov/nda.

_Nahum Melamed, Aerospace Engineer and Project Leader, The Aerospace Corporation_

**Connecting Classroom and Careers**

**Table #7**

Engage in the engineering design process for a variety of hands-on projects and then connect those projects to available career opportunities.

_Maura McClellan, STEM/Robotics Teacher, Ranchero Middle School_

**Using Inquiry to Increase Student Questions in Science**

**Table #8**

Student-generated questions are the key to transforming STEM classrooms. Experience a 5E model lesson that aids in creating an effective student-centered experiential environment challenging students to learn science through exploration. Harness student curiosity and develop skills to generate questions and explore the answers through planning and conducting investigations.

_Katherine Schenkelberg, M.A., Assistant Principal and Science Professions Development, Torrance Unified School District
Chad Mabery, Ed.D., Director of Data, Assessment, and Professional Development, Manhattan Beach Unified School District_

**Introduction to Computer Science with Alice**

**Table #9**

Discover Alice, an introductory high school computer science course useful for recruiting female students into computer science. Alice is a 3-D programming environment that creates animation and is a freely available teaching tool designed to be a student’s first exposure to object-oriented programming.

_Erik Amerikaner, STEM and Computer Science Instructor, Oak Park Unified School District_

**Incorporating Engineering into Grades 9-12 Classrooms**

**Table #10**

Experience designing a cell phone holder by looking at the engineering and design process with the engaging and fun Engineering the Future program. Investigate how new products are developed and look at a matrix of four STEM practices and how to seamlessly integrate them into great STEM experiences.

_Gary Curts, STEM Implementation Specialist, Retired High School Science Teacher_

**College and Career Readiness for STEM**

**Table #11**

Gather lesson plans that can be integrated into STEM courses to assist teachers in preparing students for college and career success.

_Kevin English, Instructional Manager, National Academy Foundation_
**STEM Skills Disability Focus**

**Table #12**

The 21st Century brings universal access to a leveled playing field for students with disabilities. This workshop focuses on Assistive Technology opportunities to engage students and open the possibilities for careers in STEM.

*Jonn Paris-Salb, Assistive Technology Consultant, California Department of Education*

**Building Academic Vocabulary Through Scenario-Based Instruction**

**Table #13**

Creating a scientific voice is no mystery, but mysteries and other scenarios are powerful, engaging tools to build the language scientists use to describe the world. Experience inquiry-based techniques that build strong academic vocabulary and support students in developing scientific thinking.

*Stacy Sinclair, Ed.D., Adjunct Faculty, University of Southern California, Rossier School of Education*

*Kim Thomas-Barrios, Ed.D., Executive Director, USC Educational Partnerships, USC Neighborhood Academic Initiative, University of Southern California*

**Developing Scales of Practice to Reflect on Teaching**

**Table #14**

Middle and high school teachers in a National Science Foundation Robert Noyce Teacher Scholarship Program developed and used scales of practice based on the National Council of Teachers of Mathematics Eight Mathematics Teaching Practices to reflect on their teaching. Learn how the experience impacted them, what they learned, and how they grew.

*Ruth Yopp, Ph.D., Professor of Education, California State University, Fullerton*

*Mark Ellis, Ph.D., Professor of Education, California State University, Fullerton*

**Engaging Teachers and Students in STEM Practices**

**Table #15**

Over the past nine years, the California State University STEM Teacher and Researcher (STAR) Program has provided nearly 500 summer research experiences to pre-service and early career teachers. Highlights of how the STAR Program Fellows serve as teacher-leaders in engaging students in scientific, engineering, and mathematical practices are discussed.

*John Keller, Co-Director, Center for Excellence in STEM Education (CESAME), California Polytechnic State University*

**Diverse Youth Contributing to Conservation Science**

**Table #16**

Learn about Pepperwood’s TeenNat science mentorship program, which begins with a five-week summer internship. Participants utilize GPS units and digital cameras to document biodiversity and then post findings on iNaturalist.org. Learning outcomes include increased knowledge of native species, STEM careers, and technical skills.

*Sandi Funke, Education Director, Pepperwood Preserve*
Clean Energy Powers Partnership: STEM Educators and the Hydrogen Fuel Cell Transportation Sector

**Table #17**
Learn about an emergent partnership of STEM educators in linked learning/pathway schools in districts and faculty/staff from East Los Angeles College and Cal State Los Angeles for STEM curricula. Hear learning experiences that use the University’s Hydrogen Research/Refueling station as a living laboratory to partner with the clean energy transportation sector.

*Cheryl Ney, Ph.D., Dean of the Charter College of Education, California State University, Los Angeles*
*Frederick Uy, Ph.D., Professor, California State University, Los Angeles*

Inclusive Project-Based Learning in Co-Teaching

**Table #18**
Science, math, engineering, and education faculty at Cal Poly, San Luis Obispo are collaborating to infuse Project-Based Learning and inclusive practices into the co-teaching model of teacher preparation. Through involvement of local New Tech High faculty, this innovative work will impact undergraduates, credential candidates, and cooperating teachers throughout the region.

*Chance Hoellwarth, Ph.D., Director of the Center for Excellence in Science and Mathematics Education, California State Polytechnic University, San Luis Obispo*
*Kurt Payne, M.S., Biology Facilitator, Lucia Mar Unified School District - Coast New Tech High*

STEAM Up Innovation and Creation with iPads

**Table #19**
Learn to use iPads as a tool to integrate art and develop an Innovation-Creation approach for your students. Participants will learn about tools to design art and technology (ArTech)-integrated lessons for science, engineering, math, and English-Language Arts. BYOD and leave the session with examples to implement in the classroom.

*Seema Khan, Instructional Technology Educator, Resource Area for Teaching (RAFT)*

Networking Reception

**Thursday, October 29 • 5:15 p.m. – 7:00 p.m.**
**Convention Center Grand Plaza**
You are invited to our reception at the outdoor Grand Plaza. Come and network with others who are passionate about STEM education! Food and beverages will be provided.
FRIDAY, OCTOBER 30

Morning Keynote
Exhibit Hall A, 7:00 a.m. – 7:50 a.m.

Introduction
Shelly Masur
CEO of Californians Dedicated to Education Foundation

Shelly Masur is the CEO of Californians Dedicated to Education Foundation. She brings almost twenty years of successful experience working as an educational leader with youth-serving non-profits and in 2013 was named as one of the “100 Women of Influence” by the Silicon Valley Business Journal. She is currently a school board member in the Redwood City School District in San Mateo County.

Keynote Speaker
Dr. Knatokie Ford
Ph.D., Senior Policy Advisor, White House Office of Science and Technology Policy (OSTP)

Dr. Knatokie Ford is a Senior Policy Advisor at the White House Office of Science and Technology Policy (OSTP) where she oversees development of national initiatives to raise visibility and improve the image of STEM fields and practitioners. She previously served as a AAAS Science &Technology Policy Fellow at OSTP from 2012-2014 and is founder and CEO of Fly Sci Enterprise, LLC. Prior to working at OSTP, Dr. Ford was a postdoctoral research fellow at Beth Israel Deaconess Medical Center in Boston, MA. She also spent time in Los Angeles where she had the opportunity to work as a background actress in television and film and serve as a middle school teacher in an underserved community in South Central Los Angeles. Dr. Ford completed her PhD in Experimental Pathology at Harvard University where she studied age-related macular degeneration and received a BS/MS in Chemistry/Biological Chemistry from Clark Atlanta University.

Topic: From Harvard to Hollywood: STEM, Storytelling, and an Outrageous Dream

The youngest of four children in a blue-collar family from Akron, Ohio, Dr. Knatokie Ford will share her inspirational journey ‘From Harvard to Hollywood’ and discuss the critical role that teachers and teaching played in shaping her career and aspirations. Well acquainted with the art of turning stumbling blocks into stepping stones, Dr. Ford turned a setback—becoming blind in one eye at the age of three—into a motivating force that compelled her to pursue a PhD in Biomedical Science. Dr. Ford spent time in Los Angeles working as a middle school teacher by day and a background actress in television/film by night. This experience unearthed her passion to academically empower youth and laid the foundation for her current work in the Obama Administration focusing on leveraging the power of storytelling to inspire a diverse generation of STEM professionals.
Awareness and Discovery: Year One of a STEM Elementary School  
**Room #201A**

**Session ID:** 288, **Strand:** 1, **Grades:** 3-5, **Audience:** A  

Presenters relate their year one experiences transitioning to a STEM school. Topics include the implementation plan, curriculum, coaching and co-teaching strategies, as well as a district perspective of the process. Teaching resources are included.

**Pamela Roden,** M.Ed., Principal, Murrieta Valley Unified School - E. Hale Curran Elementary School  
**Greg Nicholas,** TOSA, Murrieta Valley Unified School District - E. Hale Curran Elementary School

Lessons Learned: Professional Development for Teachers on Integrated Computing and STEM Education  
**Room #201B**

**Session ID:** 452, **Strand:** 2, **Grades:** MS, **Audience:** A  

Panelists from the University of California, Davis C-STEM Center and their partners will present best practices and lessons learned on professional development for STEM teachers on integrated teaching and learning of computing. Discussion of professional development content, pedagogical choices, outcomes, and follow-up activities addressing sustainability and support will occur.

**Heidi Espindola,** M.Ed., Program Manager, University of California, Davis C-STEM Center  
**Ronda DaRosa,** Ed.D., Deputy Superintendent, Yolo County Office of Education

STEM Through Comics  
**Room #201C**

**Session ID:** 432, **Strand:** 4, **Grades:** MS, **Audience:** E  

Comic arts provide “grammar” to help students learn and demonstrate STEM competence. This session explains comic arts features and shows how they can be used to increase student engagement learning and assessment by creating STEM graphic novels.

**Lesley Farmer,** Ed.D., Professor of Library Media, California State University, Long Beach

Using Project-Based Learning to Focus STEAM Learning  
**Room #201D**

**Session ID:** 209, **Strand:** 1, **Grades:** MS, **Audience:** E  

The STEAM Academy at Burke Middle School uses Project-Based Learning to integrate core academic classes with technology electives and the arts. Staff members will present examples and share lessons learned.

**Tor Ormseth,** Mathematics Teacher, El Rancho Unified School District - STEAM Academy at Burke Middle School  
**Bibi Alcantar-Martinez,** English Teacher, El Rancho Unified School District - STEAM Academy at Burke Middle School

Not-So-Flashy Tech: Integrating Technology with STEM Professional Development  
**Room #202A**

**Session ID:** 313, **Strand:** 1, **Grades:** MS, **Audience:** E  

It’s not all robotics and programming! Purposeful technology may be integrated for enhancing and modeling good teaching practices. Learn how to incorporate apps, e-portfolios, learning management systems, various technology tools, and other successes and challenges within a middle school STEM professional development program to climb up the SAMR ladder.

**David Harris,** M.A., Project Director, Escondido STEM Initiative, Escondido Union School District  
**Susan Gomez Zwiep,** Ph.D., Associate Professor, California State University, Long Beach
Designing a Career Pathway Trust with Partners

Room #202B
Session ID: 460, Strand: 5, Grades: P, Audience: P
Learn about outcomes and partnerships for grants from Pasadena City College, which is participating in two large consortia grants for the California Career Pathways Trust (CCPT). For the CCPT grants, partnerships with business, industry intermediaries, grades K-12 districts, and non-profit organizations are leveraged to deliver two models of a career pathway system.

Salomon Davila, Dean, Economic and Workforce Development, Pasadena City College

STEM Lab: A Place to Discover, Imagine, and Innovate

Room #203A
Session ID: 59, Strand: 3, Grades: 3-5, Audience: O
The Catholic Charities of Santa Clara County’s CORAL program’s new STEM Lab in San Jose, California provides STEM learning during school and expanded learning time at Robert F. Kennedy STEM Elementary School. Learn about their partnership experiences and the creation of their lab.

Aldo Estrada, STEM Coordinator, Catholic Charities of Santa Clara County

Developing STEM Educators Through Innovative Teacher Preparation

Room #203B
Session ID: 219, Strand: 2, Grades: P, Audience: P
The Claremont Colleges STEM Initiative, funded by the National Science Foundation, aims to prepare new mathematics and science teachers with the knowledge and skills they will need to become Master STEM Educators. Join the discussion of the core competencies new and experienced teachers need to realize the vision of K-12 STEM education.

Eddie Partida, Director, Claremont Colleges STEM Initiative, Claremont Graduate University

Using Code to Create Art and Animations to Engage All Students

Room #204A
Session ID: 82, Strand: 4, Grades: MS, Audience: E
Learn to code by creating art and animations using both MIT’s block-based Scratch programming language and Processing.js and JavaScript text-based language on Khan Academy in this interactive session. Lesson plans from a six-year long district program that successfully engages all students in computer science and STEM through the arts will be shared.

Sheena Vaidyanathan, Computer Science Teacher, Los Altos School District

The New California Science Framework

Room #204C
Session ID: 168, Strand: 2, Grades: All, Audience: E
The California Science Framework will be an integral tool for educators as they begin to implement the CA Next Generation Science Standards in their classrooms. This session will provide an overview of the process for revising the California Science Framework as well as a preview of its contents.

Thomas Adams, Ph.D., Director, Curriculum Frameworks and Instructional Resources Division, California Department of Education
Maria Simani, Ph.D., Executive Director, California Science Project
Making STEM Connections Come Alive!

**Room #205B**

**Session ID: 93, Strand: 1, Grades: MS, Audience: E**

Investigate intriguing hands-on activities to make engaging STEM connections come alive! Using the practices from the Common Core State Standards and the Next Generation Science Standards, integrate science, technology, engineering, and mathematics by investigating hands-on activities that explore properties of simple machines, engineering designs, artistic expression, scientific and mathematical reasoning, and much more.

*Jeanne Lazzarini, M.A.T., Math Master Teacher, Resource Area for Teaching (RAFT)*

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**Project-Based Learning: Pre-Kindergarten to Grade 2**

**Room #206A**

**Session ID: 3, Strand: 1, Grades: PK-2, Audience: E**

Experience a hands-on workshop using a Project-Based Learning approach to demonstrate how to utilize highly engaging science activities for grades PreK-2 students, every day for every child.

*Stephanie Lester, M.A., Director: Curriculum, Instruction, and Assessment, Lancaster School District*

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**Elementary Science Instruction in the Era of Next Generation Science Standards**

**Room #206B**

**Session ID: 231, Strand: 2, Grades: 3-5, Audience: A**

Gain understanding about the current status of science teaching in local elementary schools and implications for the implementation of NGSS. Findings from an exploratory study on elementary science instruction in a low socio-economic status school district in Southern California will be examined.

*Xinying Yin, Ph.D., Assistant Professor, California State University, San Bernardino*

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**Using Project-Based Learning: Culturally Responsive Literature and the Engineering Design Process**

**Room #207A**

**Session ID: 343, Strand: 6, Grades: MS, Audience: E**

Create a culturally responsive classroom incorporating literature, engineering, and Project-Based Learning using grade-level literature to understand problems and relate it to the engineering design process. Experience a novel Project-Based Learning approach that requires minimal preparation and easily fits into daily lessons, and leave with plenty of ideas and samples.

*Seema Khan, Instructional Technology Educator, Resource Area for Teaching (RAFT)*

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**Go Probe: Teaching With Sensors and Apps**

**Room #207B**

**Session ID: 123, Strand: 1, Grades: MS, Audience: E**

Turn any electronic device into a probe sensor. Come play with probes that will enhance your students’ observations and data collection skills. Learn how students create, collect, and communicate their results using a variety of free programs and apps.

*Jenifer Perazzo, Science Specialist, Pleasanton Unified School District and Lawrence Berkeley Lab*

*Stacey Holder, Science Specialist, Pleasanton Unified School District - Fairlands Elementary School*
Femineers: A Model for Attracting and Retaining Girls in STEM  
**Room #207C**  
**Session ID: 200, Strand: 6, Grades: HS, Audience: E**  
The Femineers Program was created and funded by Cal Poly Pomona's College of Engineering in 2013 to inspire females to pursue STEM in their education and career. The model program can be replicated to build awareness, capacity, and interest in STEM education and STEM careers to promote prosperity in the community.  
Gerri Cole, Ph.D., Outreach Program Director, College of Engineering, California State Polytechnic University, Pomona  
Jaklen Keshishyan, Graduate Student, California State University, Long Beach

Digital Storytelling for STEM Classes!  
**Room #207D**  
**Session ID: 143, Strand: 4, Grades: HS, Audience: E**  
Learn tips and tricks for implementing digital storytelling in your STEM program! Topics include storytelling, group assessment strategies, copyright law, the creative commons, citing courses, and web tools (PowToon, Prezi, Google slides, Animoto, graphic novels, cartoons, and more).  
Jeff Schmidt, Career Technical Education Coordinator, Santa Clara County Office of Education  
Cecilio Dimas, STEAM Director, Santa Clara County Office of Education

Girls Can Too! STEM Success for Young Women  
**Room #208A**  
**Session ID: 488, Strand: 6, Grades: MS, Audience: C**  
For the past 50 years, female engineers have made up only 10 percent of the workforce. Join this interactive group exercise and learn how the San Diego Science Alliance’s program Better Education for Women in Science and Engineering (BE WISE) is pulling together academia, industry, non-profit organizations, and the community to increase girls in STEM.  
Ellen Peneski, Executive Director, San Diego Science Alliance  
Karen Overklift, Be Wise Program Director, San Diego Science Alliance

Science Day Camp: Creating Authentic Connections Between Families and Schools  
**Room #208B**  
**Session ID: 208, Strand: 3, Grades: HS, Audience: E**  
The Next Generation Science Standards represents a paradigm shift in thinking for teachers and families. See a model Engineering Day Camp bridging gaps to community and increasing access to expanded learning time at schools. Program includes detailed implementation plans, actual demonstrations, and videos on how to make Engineering Day Camp work at your school.  
Michael Towne, Mathematics Teacher, Val Verde Unified School District  
Lou Randall, STEAM Coordinator, Val Verde Unified School District
Creating and Sustaining 21st-Century Classrooms: Pedagogy, Assessment, and Design
Room #209A
Session ID: 77, Strand: 2, Grades: 3-5, Audience: A
The Piner-Olivet Union School District’s Reimagining Learning Collaborative of grades K-8 teachers created viable models of innovative instructional practices, authentic assessments and learning environments for 21st-century student needs. Teachers developed instructional goals with performance assessments and created a digital portfolio/blog/website of their work. Come hear how to make this happen in your district.
Gina Silveira, Principal, Piner-Olivet Union School District

Programming, Robotics, and Three Dimensions in a Continuation High School
Room #209B
Session ID: 437, Strand: 1, Grades: HS, Audience: E
Learn how using Code.org, Codecademy, Khan Academy, Minecraft, Autodesk 123D, STEMFuse, TeacherGeek, and VEX simultaneously keep learners who may want choices and the ability to change directions whimsically in programming, robotics, and 3-D design stay active by finding what works for them in the moment.
Dennis Ashendorf, M.S., Mathematics and Science Teacher, Newport-Mesa Unified School District

Speedometry: Teaching Inquiry Science Through Play
Room #210A
Session ID: 233, Strand: 1, Grades: 3-5, Audience: E
Try Speedometry, a free-to-use integrated STEM curriculum for grade 4 students that teaches physics through play. In this hands-on workshop, attendees learn how to engage both girls and boys in exciting STEM activities using the 5E model of instruction, including a model lesson with an opportunity to try.
Fred Freking, Associate Professor, University of Southern California, Rossier School of Education
Tyron K. Young, University of Southern California, Rossier School of Education

ocMaker Challenge: Using “Making” to Deliver High-End STEM Technologies
Room #210B
Session ID: 41, Strand: 1, Grades: HS, Audience: E
Excite and engage your students while delivering STEM competencies, 21st-century skills, Next Generation Science Standards, and the Common Core State Standards! The ocMaker Challenge prompts teams from middle school through college to design and build a product that will solve a problem. Students use 3-D modeling, 3-D printers, and microcontrollers to create original prototypes.
Jillian Johnson-Sharp, M.A., Coordinator, Curriculum and Instruction, Orange County Department of Education, Career Technical Education Partnership
Chrissy Cherry, Instructional Programs Assistant, Orange County Department of Education, Career Technical Education Partnership

Piloting STEM Enrichment for Foster Youth
Room #210C
Session ID: 376, Strand: 6, Grades: 3-5, Audience: O
California’s 66,000 foster youth are underserved in out-of-school STEM. San Mateo County’s Human Services, Learningtech.org, and Infinite Education describe a collaborative pilot in summer camps. Program successes and lessons building STEM skills and confidence are shared, including career exploration and emotional and behavioral sessions, which encourage engagement in coding, robotics, and Making.
Josie Yu, Ph.D., STEM Education Coordinator, County of San Mateo, Human Services Agency
Mark Miller, Ph.D., Chief Executive Officer, Learningtech.org
Sustainability Projects to Develop STEM Skills

Room #210D
Session ID: 97, Strand: 1, Grades: HS, Audience: E
Access project-based learning opportunities such as energy auditing, solar phone-charger design, and aquaponics. Receive no-cost curriculum for over 15 high school STEM projects and gain hands-on experience in conducting a school energy audit. Provide students with skills directly applicable to the expanding green sector and STEM careers.

Emily Courtney, Program Director-Education, Strategic Energy Innovations
Sophia Zug, Associate Project Coordinator, Strategic Energy Innovations

STEM in Pre-Kindergarten, Transitional Kindergarten, and Kindergarten

Room #211A
Session ID: 378, Strand: 1, Grades: PK-2, Audience: E
Learn playful ways to introduce children to STEM ideas and skills through developmentally appropriate curriculum that integrates literacy and the arts through references of the Preschool Curriculum Framework and Learning Foundations, the Next Generation Science Standards, and the Common Core State Standards.

Gay Macdonald, M.A., Former Executive Director, UCLA Early Care and Education
Osnat Zur, Ph.D., Senior Program Associate, WestEd

Developing a Three-Dimensional Next Generation Science Standards High School Science Unit

Room #211B
Session ID: 400, Strand: 1, Grades: HS, Audience: E
Engage in how to develop and teach a three-dimensional sequence of lessons about the ocean’s influence in global climate change. Learn how this lesson, showcased at the Next Generation Science Standards rollout symposium, was developed so the process can be transferred to your units.

Jill Grace, M.S., Regional Director/President Elect, K-12 Alliance@WestEd/California Science Teachers Association
Jeff Orlinsky, M.A., Teacher/High School Director, Warren High School/California Science Teachers Association

Developing STEM Modules for Your Classroom

Room #212A
Session ID: 402, Strand: 1, Grades: 3-5, Audience: E
The California Mathematics and Science Partnership, San Luis Obispo, is in year two of creating STEM modules that integrate the Common Core State Standards and the Next Generation Science Standards, with emphasis on the engineering design process. Learn about STEM in the Environment and Energizing STEM.

Lola Berber-Jimenez, Chair, Liberal Studies, California Polytechnic State University, San Luis Obispo
Trina Nicklas, CaMSP Project Director, Paso Robles Unified School District

STEAM and Engineering: Creating Creative Minds

Room #212B
Session ID: 159, Strand: 4, Grades: 3-5, Audience: E
This hands-on module shows how Feaster Charter School’s award-winning lab integrates the arts into engineering lessons. Students learn to expand their creative thinking skills through curriculum that meets both the Next Generation Science Standards and the Common Core State Standards. The presentation also includes information on the school and the program.

Cassie Santos, Grades K-8 Engineering Teacher, Chula Vista Elementary School District - Feaster Charter School
Grant Proposal Writing for STEM Teachers

Room #213A

Session ID: 401, Strand: 2, Grades: MS, Audience: E

Grant proposal writing may be simple if a few key principles are applied. Explore opportunities for grades K-12 STEM teachers to find support for standards-aligned Project-Based Learning in STEM classrooms. A list of K-12 grant funding opportunities will be distributed, along with tips for successful proposals.

Deidre Sessoms, Ph.D., Director, Faculty Research Development, California State University, Sacramento
Kim Williams, Middle School Teacher, Sacramento City Unified School District

Project Prototype: Further Lessons Integrating Engineering in the Science Classroom

Room #213B

Session ID: 424, Strand: 1, Grades: MS, Audience: E

Engage in engineering and science with Project Prototype, which explores how engineering fits into the science classroom. Teachers in this partnership of three districts, two universities, one college, and the local community are learning that engineering in the Next Generation Science Standards is not an add-on, but the driver of deep science learning.

Peter A’Hearn, K-12 Science TOSA, Palm Springs Unified School District
Philip Hudec, Secondary Science/NGSS Teacher On Special Assignment, Palm Springs Unified School District

Making STEM Matter: Interactivity of the Digital and Physical World

Room #213C

Session ID: 138, Strand: 6, Grades: MS, Audience: E

Reach underserved, migrant, English learners, and female students through a STEAM program. Take the abstract digital world of programming and computing and make it a tangible, cross-curricular experience. The program was created by California State University, Bakersfield faculty and students for outlying districts of Kern County but is applicable to any elementary classroom.

Jesus Esquibel, M.A.T., Lecturer, California State University, Bakersfield
Robin Valente, M.S.Ed., Educational Coordinator, California State University, Bakersfield

Noches de Ciencias: Pathway to Engaging Parents and Empowering Students

Room #213D

Session ID: 397, Strand: 3, Grades: HS, Audience: O

Learn from students and teachers about successful program design for engaging Spanish-speaking parents, identifying impact on programs based on key principles, and gathering support from local communities with activities for students in grades K-12.

Martha C. Pelayo, Director of Special Projects, Society of Hispanic Professional Engineers

We want your feedback!

Please complete the session and Symposium surveys. For each survey completed, you increase your chances of winning a prize!
PLEDGE GOAL: 50,000

Million Women Mentors®, an initiative of STEMconnector®, is a national movement which supports the engagement of one million STEM mentors (male and female) to increase the number of girls and women from school age to work age continuum to persist and succeed in STEM programs and careers by the year 2018.

THROUGH ENGAGING ONE MILLION MENTORS BY 2018, OUR GOALS ARE TO:

1. Increase the percentage of U.S. high school girls planning to pursue STEM careers.
2. Increase the percentage of U.S. young women pursuing undergraduate degrees in STEM fields in higher education.
3. Increase the percentage of U.S. women staying and advancing in STEM careers through supporting workforce-mentoring programs.

JOIN THE MOVEMENT AND PLEDGE TODAY!

A California Leadership Council is under development and our partners include Government, Private Sector, Educational and Non Profit organizations. We need you to join our efforts by contacting the CA leads for Million Women Mentors or looking for us during the Symposium. You can also visit www.millionwomenmentors.org and click “Make a Pledge Now” to join today! A “Pledge” with MWM is a commitment made to mentor a girl in STEM for 20 hours in the year and will also sign you up to receive regular communication from the national movement. Throughout this mentorship process, along with your help, MWM aims to provide the information necessary to help girls and women persist and succeed in STEM programs and careers.

“For more information contact:

Nancy Kirshner-Rodriguez – (916) 651-5405 – Nancy.KirshnerRodriguez@women.ca.gov
Beth Broome – (530) 752-9310 – BFBroome@ucdavis.edu

“California is a global leader in industries involving Science, Technology, Engineering and Mathematics (STEM). It is time for California to become a global leader in female participation in STEM fields, too.

We can make that a reality by welcoming female students to STEM education with role models, mentors and encouragement.” - Lupita Cortez Alcalá, Deputy Superintendent of Public Instruction and First Vice Chair, CA Commission on the Status of Women and Girls
Inspiring Girls to Code with #girlscan
Room #201A
Session ID: 315, Strand: 6, Grades: HS, Audience: E
Discover the success of the Girls Who Code program to inspire girls to pursue computer science. See how teachers and administrators may be a part of the solution to the current gender inequality in computer science education and in the workforce using research-based computer science curriculum relevant to girls.
Shin Adachi, Teacher, Girls Who Code

Intersection Between STEM and the Built Environment
Room #201B
Session ID: 423, Strand: 1, Grades: 3-5, Audience: A
Clearwater Elementary School's Drought Response Outreach Program for School's grant funded storm water harvesting strategies and increased student awareness of California's water resources. Hear about developing synergies between grant funding, non-profit community groups, and the built environment to provide access to high-quality environmental education resources and experiences.
Tina Daigneault, Chief Business Official, Perris Elementary School District
Eric Carbonnier, Architect/Associate/Environmental Analyst, HMC Architecture

Teaching Integrated Mathematics 1 with Computing and Robotics
Room #201C
Session ID: 468, Strand: 1, Grades: HS, Audience: E
The University of California, Davis C-STEM A-G approved curriculum Integrated Math 1 with Computing and Robotics guides students through topics in the Common Core State Standards while simultaneously teaching students programming and computational thinking. Hear about the standard compliant courseware and teaching strategies for integrating computing and robotics into Integrated Mathematics 1 and Algebra.
Harry H. Cheng, Ph.D., Professor and Director, University of California, Davis C-STEM Center
Stephen Mason, Mathematics Teacher, Hillcrest High School

Re-Engineering Instruction to Highlight STEM Throughout the Day
Room #201D
Session ID: 547, Strand: 1, Grades: 3-5, Audience: E
To effectively incorporate STEM into daily instruction, one must identify where and how the school curriculum can reasonably lend itself to STEM and ST2REAM (science, technology, thematic instruction, reading, writing, engineering, art/visualization, and mathematics) in the classroom. Beyond the superficial level of instruction, creative STEM applications are brought to life in classrooms that guarantee student engagement.
Kenneth Wesson, Ph.D., Educational Consultant, Neuroscience

Scientists and Engineers: Preparing and Placing STEM Professionals in Classrooms
Room #202A
Session ID: 433, Strand: 5, Grades: 3-5, Audience: C
Scientists and engineers can be powerful partners in the Next Generation Science Standards Science and Engineering Practices. Get strategies for preparing STEM professionals to present learning activities to students. Topics include: key elements of successful partnerships, recruitment and training, logistics, and effective roles for STEM professionals as volunteers in schools.
Teresa Barnett, Executive Director, Community Resources for Science
Handing Over the Reins: STEM Students Designing New Community Futures
Room #202B
Session ID: 336, Strand: 5, Grades: MS, Audience: E

Sixty STEM students in the Bear Valley Unified School District learned about and became community development and urban planning professionals. Through a student-hosted public meeting, they helped community leaders and elected officials design the future of a riparian corridor. Learn about the fun that can occur when teachers give students the reins.

Siri Champion, Principal, Three Strands Planning and Development
Tracy Tokunaga, Teacher, Big Bear Middle School

Shifting the Lessons: Turning One Dimension into Three Dimensions
Room #203A
Session ID: 188, Strand: 1, Grades: MS, Audience: E

Life in the Balance is the title of an Instruction Case developed by the Integrated Middle School Science Project. The unit development process will be explained, including bundling the Next Generation Science Standards performance expectations, writing three-dimensional objectives, and designing a learning progression which builds toward the performance expectations.

Anna Newman, Science Coordinator, Alameda County Office of Education

Leadership in Middle School Mathematics
Room #203B
Session ID: 367, Strand: 2, Grades: MS, Audience: E

Experience research-supported, systematic Common Core State Standards for Mathematics (CCSS-M) instruction for the middle school. Engage with a CCSS-M lesson emphasizing fluency and conceptual understanding, with the goal of inspiring teachers to become leaders through effective and engaging instruction.

Wendy Creek, M.A., Affiliated Faculty, Loyola Marymount University
Michael Castiglione, M.S., Program Director of Teacher Leadership, Loyola Marymount University

STEM Outreach to Girls: Ensuring Equity in Schools
Room #204A
Session ID: 501, Strand: 6, Grades: MS, Audience: E

Join discussions to identify barriers for girls in STEM, and learn how to remove those barriers by ensuring equity laid out in the California Quality Schooling Framework. Also provided are resource tools, promising practices, and research for STEM outreach to girls in schools.

Janet Liang, Ed.D., Education Programs Consultant, California Department of Education

Designing Professional Development to Make Mathematics Accessible to All Students
Room #204C
Session ID: 442, Strand: 2, Grades: MS, Audience: E

Engage in small-group activities that present a useful framework for thinking about interculturally aware mathematics teaching and professional development; identify examples, partial examples, and non-examples of responsive instruction, and plan for practicing a key strategy in a classroom or collegial setting.

Shandy Hauk, Ph.D., Senior Research Associate, WestEd
Science and Environmental Engineering for Secondary (SEES) Teachers

**Room #205A**

**Session ID: 515, Strand: 5, Grades: HS, Audience: C**

Learn how the Science and Environmental Engineering for Secondary (SEES), a California Mathematics and Science Partnership, addresses the recommendations of the California Blueprint for Environmental Literacy. The SEES project successfully uses environmental issues as the context for incorporating the Engineering Practices from the Next Generation Science Standards into existing secondary science classrooms.

*Anne Stephens, Ph.D., Professor, California State University, Chico*
*Brandi Aranguren, Director, Center for Mathematics and Science Education, California State University, Chico*

**Contextualized Chemistry: Bringing Career Relevance to Your Classroom**

**Room #205B**

**Session ID: 210, Strand: 3, Grades: HS, Audience: E**

Bring relevance to your chemistry classroom through career-focused readings, labs and activities, and free resources aligned to the Next Generation Science Standards. Look at new ways to integrate exciting career-focused curriculum into your chemistry classroom, from medical chemistry to green chemistry to chemistry involved in global trade.

*Jewyl Clarke, Teacher and Curriculum Designer, Grossmont College Core Academics for Careers*

**Exploring Two Paths to Gender Equity in STEM Extracurricular Activities**

**Room #206A**

**Session ID: 114, Strand: 6, Grades: MS, Audience: E**

Highlights regarding gender equity and integration and separate-but-equal pathways from the middle school after school STEM-based clubs that ensure participation and interest of both males and females will be discussed. Both examples are from middle school but apply to grades K-12.

*Connie Mitchell, Digital Media Instructor, Nellie N. Coffman Middle School*
*Sherri Stansbury, GIRLS Advisor and Engineering Instructor, Nellie N. Coffman Middle School*

**Strengthening STEM in Local Control and Accountability Plans**

**Room #206B**

**Session ID: 268, Strand: 1, Grades: HS, Audience: E**

A new toolkit designed to help STEM educators and advocates develop their Local Control and Accountability Plan (LCAP) will be presented. Attendees will learn how to participate in developing a STEM-focused LCAP, become familiar with exemplar STEM LCAPs, and test-drive tools to strengthen STEM in your LCAP.

*Chris Roe, President and CEO, California STEM Learning Network*

**It’s Elementary: STEM That Is!**

**Room #207A**

**Session ID: 346, Strand: 1, Grades: 3-5, Audience: E**

See how a mystery bag challenge can intrigue students and get them thinking as scientists, engineers, and mathematicians. The hands-on session shares lessons and activities for participants to put into practice immediately. Gain insight on how to use the 4Cs, the 5Es, and alignment to the Common Core State Standards with student STEM notebooks made easy.

*Andrea Brown, M.A., Science, STEAM, Science Olympiad Curriculum and Instruction Teacher on Special Assignment, Hacienda La Puente Unified School District*
*Jennifer Mataele, Technology/STEAM Teacher on Special Assignment, Hacienda La Puente Unified School District*
Scaffolding Learning to Build Potential in All Kids: Exploring Computer Science

Room #207B

Session ID: 244, Strand: 6, Grades: HS, Audience: E

Panelists demonstrate the equity-focused introductory curriculum and professional development program, Exploring Computer Science (ECS), showing how it develops students’ skills and confidence for success in applications. An award-winning teacher and student share how ECS builds potential to pursue advanced academic and career opportunities.

Julie Flapan, Executive Director, ACCESS and Director, Exploring Computer Science, ACCESS and UCLA Center X
Leslie Aaronson, Teacher, Foshay Tech Academy

Partnerships that Transform: STEM Learning Is Everywhere and Everyone

Room #207C

Session ID: 325, Strand: 5, Grades: 3-5, Audience: E

Panelists share innovative and successful cross-sector STEM partnerships and provide outstanding resources, such as Boeing’s Informal Science Institution collaborative and Chevron’s Fab Labs and STEMZONE. Business, community, and post-secondary partnerships can transform STEM learning so that it is accessible everywhere and includes and involves everyone.

Claire Cavallaro, Ph.D., Dean, College of Education, California State University, Fullerton
Joan Bissell, Ed.D., Director, Teacher Education and Public School Programs, California State University

Implementing the Next Generation Science Standards One Layer at a Time

Room #207D

Session ID: 211, Strand: 2, Grades: MS, Audience: E

Implementing the Next Generation Science Standards in middle school is a multistep process, best taken one step at a time. See lessons learned in two years of facilitating this process at three middle schools with 20 highly capable teachers in a collaborative process.

Cary Sneider, Ph.D., Associate Research Professor, Portland State University
Theresa Ellis, M.S., Eighth Grade Teacher, West Linn-Wilsonville School District, Oregon

Weather Watchers Using Models, Maps, and Data

Room #208A

Session ID: 11, Strand: 1, Grades: MS, Audience: E

Develop exciting strategies for incorporating deeper thinking and questioning that includes science, art, music, mathematics, and visual literacy. Participants will be invited to “shift” their thinking by incorporating Project-Based Learning, the Next Generation Science Standards, and Common Core State Standards while engaged in exciting hands-on experiences using weather models, maps, and data.

Jan Robertson, M.S., Science Teacher on Special Assignment, Mt. Diablo Unified School District
Maria Laws, M.S., Teacher, Acalanes Unified School District

All-Around STEM: Young Engineer

Room #208B

Session ID: 83, Strand: 1, Grades: PK-2, Audience: E

Educators will learn how to use hands-on activities to emphasize the “E” in STEM. The presenter will model and explain methods for facilitating an effective STEM environment and provide activity ideas to be the basis for Project-Based Learning.

Shalek Chappell-Nichols, M.S., Master Teacher, Research and Design Specialist, Resource Area for Teaching (RAFT)
Let the Tablet Tell a Digital Science Story

**Room #209A**

**Session ID: 331, Strand: 1, Grades: MS, Audience: E**

Demonstrations and examples show attendees the use of digital tablets for crafting science digital stories with popular video-editing apps, along with other resources. Learn to promote science writing and visual literacy skills.

*Roger Pence, Teacher, Benicia Unified School District*

Using Response Systems for Formative Assessments in Mathematics Class

**Room #209B**

**Session ID: 131, Strand: 1, Grades: MS, Audience: E**

Learn how to engage all students by using various response systems for formative assessment through a primary problem-solving activity (estimation) to address Common Core State Standard Mathematical Practice (CCSS MP) 2, Reason Quantitatively, and a middle school problem-solving activity (fractions) to address CCSS MP 3, Construct Viable Arguments.

*James Friedrich, Mathematics Teacher, Manufacturing Production Technology Academy*

Learning Design While Meeting Local Community Needs

**Room #210A**

**Session ID: 475, Strand: 1, Grades: HS, Audience: E**

Hear how the EPICS method of design uses needs within the local community as context for designs that can meet many of the Next Generation Science Standards. The approach is an affordable way to engage diverse students and introduce them to engineering.

*William Oakes, Director and Professor, EPICS Program, Purdue University*

Fremont Academy of Design and Engineering: Lessons Learned

**Room #210B**

**Session ID: 435, Strand: 3, Grades: HS, Audience: E**

Hear from Pomona Unified School District’s Fremont Academy of Design and Engineering, who will highlight tips for starting a design and engineering academy, hiring and training staff, developing curriculum, considering facilities, engaging girls through its popular Femineers program, and establishing community partnerships.

*Gilbert Baez, Associate Principal, HMC Architects
Elizabeth Harper, M.A., Principal, Fremont Academy of Engineering and Design*

Game Design and STEAM Play

**Room #210C**

**Session ID: 472, Strand: 4, Grades: HS, Audience: E**

Learn about a game design pathway pairing the Unity development platform with an examination of the socio-economic role of games. Students gain skills and social-emotional awareness through a combination of hands-on programming and minds-on analysis of the importance of gameplay.

*Donna Mandosa, Technology Director, Palisades Charter High School*
Gizmos: Using Online Simulations to Improve Conceptual Understanding in Science  
Room #210D  
Session ID: 186, Strand: 1, Grades: MS, Audience: E  
Experience the incorporation of live simulations in life and physical science. See how use of online simulations to introduce, develop, and expand conceptual understanding helps science topics come to life and deepens understanding. Instructional strategies will include how to use Gizmos with iPads, interactive whiteboards, and computers.  

*Cynthia Rounds, M.A., Middle School Science and Apple Distinguished Educator, Fullerton School District and Explore Learning*

**Ardusat Space Kits in the Classroom**  
Room #211A  
Session ID: 127, Strand: 1, Grades: HS, Audience: E  
A hands-on workshop of the Ardusat Space Kit to teach coding and sensor data gathering. Participants learn to: 1) wire up Arduino and sensors using a breadboard, 2) upload a sketch to collect data and modify to get desired results, and 3) apply conditions on a sensor to observe data changes.  

*Tinh Tran, STEM Teacher, University High School*

**Next Generation Science Standards Engineering Design in the Middle School Physical Science Classroom**  
Room #211B  
Session ID: 184, Strand: 1, Grades: MS, Audience: E  
Physical science teachers share results from a California Mathematics and Science Partnership middle school lesson study through a sequence of lessons that illustrate two key points about the Next Generation Science Standards Engineering Design Standards (Middle School – Engineering, Technology, and Applications of Science 1). Most lessons are not stand-alone, and many do not involve the construction of anything.  

*Paul Killian, M.S., STEM Project Director, ABC Unified School District  
Nancy Ziolekowski, M.A., Middle School Teacher, ABC Unified School District - Whitney High School*

**STEM and the Arts: It Is an Interdisciplinary World**  
Room #212A  
Session ID: 319, Strand: 4, Grades: 3-5, Audience: E  
Engage in a visual arts demonstration to experience the applications to STEM. Students of the 21st Century must be able to use a variety of skills to understand and solve complex problems. Through engagement in sequential disciplinary learning in the arts, see how elementary students can gain these skills.  

*Kristine Alexander, Executive Director, The California Arts Project, California Subject Matter Projects*

**Simulated Water Management Model: A Model of Critical Thinking**  
Room #212B  
Session ID: 520, Strand: 1, Grades: HS, Audience: E  
The United States Army Corps of Engineers demonstrates the Simulated Water Management Model (SWMM), developed to promote students’ critical thinking through participation in computer modeling games in four subject areas (Earth Science, Physical Science, Physics, and Trigonometry). All resources are free, online, and available to teachers to use for STEM curricula augmentation.  

*Hunter Merritt, M.S., Water Resources Planner, U.S. Army Corps of Engineers, Sacramento District*
Why Girls Love and Leave STEM

Room #213A
Session ID: 185, Strand: 6, Grades: MS, Audience: O

From research conducted by the National Alliance for Partnerships in Equity and other institutions, it is clear that girls are high achievers in STEM but leave STEM majors for what they perceive as more “nurturing” careers. Participants will identify how to help all students understand that STEM careers have nurturing fields and unlimited possibilities for their future.

Linda Christopher, Ed.D., Executive Director, Orange County STEM Initiative

Will and the Waste Monster

Room #213B
Session ID: 439, Strand: 1, Grades: 3-5, Audience: E

Cover the environmental issues of waste, water, and energy in an interactive way for elementary students with a series of sustainability workshops. The curriculum is demonstrated along with information on how teachers can get the free e-book and PDF, and how secondary students are teaching the workshops in elementary schools.

Eera Babiwiwale, Director, Designing Futures Foundation
Sandra Kate, Sr. Educational Planner, HMC Architects

Let’s Talk STEAM in the Classroom

Room #213C
Session ID: 353, Strand: 4, Grades: 3-5, Audience: E

What should STEAM look like in the classroom? Explore the nuances of STEAM and STEM and see how the arts are able to enhance scientific and mathematical thinking through the use of visual arts and music, in relation to the Next Generation Science Standards and the Common Core State Standards for Mathematics.

Anthony Quan, Consultant II, STEM, Los Angeles County Office of Education

Making More Out of Mathematics Activities

Room #213D
Session ID: 358, Strand: 3, Grades: 3-5, Audience: O

Get an overview and hands-on activities for elementary students in an after-school setting. Projects and mathematics-based activities include small-group and individual games, activities, and projects that stimulate critical thinking and inquiry.

Bruce Jackson, Program Director, Bayview Charities

We want your feedback!
Please complete the session and Symposium surveys. For each survey completed, you increase your chances of winning a prize!
Join facilitated conversations led by STEM educators and experts. Join facilitated conversations led by STEM educators and experts.

Each round will last 15 minutes. Attendees can participate in four different discussions during this session.

Activating Student Leadership: Sustainability
Project-Based Education and Conservation Campaigns

Table #1
Learn about high school sustainability-focused projects such as student energy auditing, building a solar thermal collector, or conducting a sustainability assessment for a local business. Engage and inspire students with applied projects and campus conservation campaigns. Provide students with skills directly applicable to the expanding green career sector.

*Emily Courtney, Program Director-Education, Strategic Energy Innovations*
*Sophia Zug, Associate Project Coordinator, Strategic Energy Innovations*

Science Notebooking with Notability:
STEM Technology Integration!

Table #2
Gain practical strategies for implementing a content-rich technology integration program using 1:1 tablet devices to teach the Common Core State Standards learning objectives in a rigorous, relevant, and realistic way. Learn how to take science notebooks to the next level on a table device with the Noteability app.

*Katelyn Gilliard, M.A., Teacher, Ontario-Montclair School District - Vineyard STEM Magnet School*
*Jillian Bermudez, Teacher, Ontario-Montclair School District - Vineyard STEM Magnet School*

Teaching About Tech: Getting Teachers STEM Ready

Table #3
Explore how to build the capacity of elementary teachers to learn about technology as a subject, and provide activities for them to do with students.

*Lesley Farmer, Ed.D. Professor of Library Media, California State University, Long Beach*

Urban Bird Awareness:
Connecting Students, Nature, and Technology

Table #4
Learn to facilitate a citizen science project about birds. In this customizable project, students gain multiple skills, such as real-time data collection, data analysis, visual and aural distinction, classification, graph design and interpretation, habitat conservation, and use of Google Drive, while also utilizing binoculars, smartphones, tablets, and cameras.

*Kiandra Haaf, M.A.T., Teacher, Anaheim Union High School District*
*Clay Elliott, M.A.T., Science Curriculum Specialist, Anaheim Union High School District*
Academic Language Development in Science Class

**Table #5**

Connect the Next Generation Science Standards and the Common Core State Standards with an emphasis on academic language. Receive activities and examples to help teachers support students’ academic language development in science class. Gain information regarding the incorporation of Crosscutting Concepts and Engineering Practices in science lessons.

_Hui-Ju Huang, Ph.D., Professor, California State University, Sacramento_

ITEAMS: Integrated Technology, Engineering, Math, and Science

**Table #6**

Hear findings from a three-year collaboration between San Francisco State University, the Exploratorium, and regional schools, providing professional development for a cadre of 60 grades 3-8 teachers currently implementing lessons they have created to engage students in the engineering design process with explicit attention to the Common Core State Standards for Mathematics and the Next Generation Science Standards.

_Larry Horvath, Assistant Professor Secondary Education, San Francisco State University_
_Molly Todd, Project Director, San Rafael City Schools_

Phenomena-Based Teaching: The Middle School Integrated Model

**Table #7**

University faculty and science coaches partnered to use a grounding phenomenon to teach an integrated Next Generation Science Standard unit involving Earth, Life, and Physical Science Performance Expectations, which served as a pivotal tool in professional learning of the Next Generation Science Standards. Receive a phenomena-based unit outline that encompasses three-dimensional learning using an integrated approach.

_Leena Bakshi, Science Coordinator, Alameda County Office of Education/Integrated Middle School Science Partnership_

M3 Concept: Making Mathematics Meaningful

**Table #8**

Explore how STEM themes are intertwined in mathematics content standards to broaden the goal of mathematics education from mere mastery of algorithms to development of critical thinking and problem-solving skills by transforming a mathematics classroom into a vibrant learning community through a theme-based lesson plan.

_Deepika Srivastava, Coordinator-Moreno Valley Math League, Moreno Valley Unified School District_

The National Math and Science Initiatives: Laying the Foundation Teacher Training Program

**Table #9**

Experience how the Laying the Foundation Teacher Training Program has transformed schools into rigorous STEM-focused institutions. Training description and examples are provided to show Laying the Foundation is committed to ensuring that all students are prepared for the global economy of the 21st century.

_Debbee Reynolds-Johnsen, M.Ed., Development Director, National Math and Science Initiative_
_Nathan Douglas, Business Development Coordinator, National Math and Science Initiative_
Grass Roots STEM: Becoming a 2015 Gold Ribbon School

**Table #10**

Hear the journey of the creation of grades 7 and 8 STEM courses at Cavitt Junior High School and how it impacted school enrollment, equalized gender performance in science, and increased the number of female students taking the STEM electives.

*Jennifer Platt, M.A., Principal, Eureka Union School District - Cavitt Junior High School*

*Shelly Davis, STEM and Science Teacher, Eureka Union School District - Cavitt Junior High School*

Where Are the Latinas? The Missing Link

**Table #11**

Engage with experts as they share best practices focusing on Latinas in STEM and STEM equity. Gain an understanding of the importance of connecting and motivating young Latinas in STEM, how partnerships can help close this major gap, and the impact of Latinas in STEM.

*Beatriz Garcia, Director of Operations, Society of Hispanic Professional Engineers*

*Jennifer Vasquez, Senior Director, Society of Hispanic Professional Engineers*

What Contextual Factors Propel High School Students into Advanced STEM Courses

**Table #12**

Policymakers and educators learn about the evidence regarding the impact contextual factors, such as classrooms, mentors, and peers play on advanced placement math and science course taking. Knowing which factors are significant will assist with the evaluation of productive educational environments.

*Michael Gottfried, Ph.D., Professor, University of California, Santa Barbara*

*Ann Owens, Ph.D., Assistant Professor, University of Southern California*

The Power of Coaching STEM/STEAM

**Table #13**

So you have been hired to be a STEM Coach or TOSA! Multiple models of support and coaching are out there, but are they helpful? Examine practices for effective coaching and explore the roles needed in the coaching continuum.

*Jennifer Janzen, Science Coordinator, Santa Clara County Office of Education*

Creating a STEM Learning Ecosystem

**Table #14**

How can facility design support an integrated STEM learning ecosystem? Explore how space influences instructor and learner behavior, mediates the learner’s experience, and supports integration of expanded informal and formal learning environments. Learn to leverage the unique potential of informal and formal learning environments for a STEM program.

*Lauren Scranton, M.A., Director of Research and Development, NAC Architecture*

*Helena Jubany, Principal, NAC Architecture*
Engineering Is Elementary and Credentialed Teachers at a Community Organization

Table #15
As part of a university course, teachers created and taught workshops on STEM for elementary and middle school youth at a community-based organization. As a starting point, Engineering is Elementary curricula and integrated educational technologies were used. The presentation describes the pedagogical model and experiences of participating teachers and youth.

Stephen Adams, Professor, Educational Technology and Media Leadership, California State University, Long Beach

Career Technical Education and STEM: A Model for Integration, Imagination, and Innovation

Table #16
Get examples and resources for Project-Based Learning, service learning, and other models of true STEM integration in Career Technical Education programs. Other topics include model curricular resources and connections between STEM projects, the Common Core State Standards, and Career Technical Education Standards.

Jeff Schmidt, Career Technical Education Coordinator, Santa Clara County Office of Education

Summer Science Camps: Academic Enrichment for Youth, Mentored Teaching Experience for Pre-Service Teachers

Table #17
Learn about summer science camps offered the past 16 years by California State University, Long Beach for area youth, with a parallel camp for homeless youth started in 2008. Co-taught by in-service and pre-service teachers, the camp provides a mentored teaching opportunity for prospective teachers while giving students a chance to engage in science learning.

Laura Henriques, Ph.D., Past President/Professor, California Science Teachers Association/California State University, Long Beach

Silicon Valley Education Foundation

Table #18
Learn about an independent study by the WestEd research group, a regional wing of the United States Department of Education, that showed participating students increased their algebra readiness by 2.4 times versus the control group when using the Elevate (Math) program – an intervention program for struggling grade 8 students.

Steven Han, STEM Program Coordinator, Silicon Valley Education Foundation

Engineer Stronger Expanded Learning Programs: Convene, Identify, Brainstorm, Engage

Table #19
Learn how to engineer stronger expanded learning programs using tested processes resulting from a ground-breaking three-year initiative called the Summer STEM Project. Participants will be introduced to an engineering approach to improve program quality, influence student attitudes towards STEM learning, and increase staff confidence in leading STEM activities.

Andrea Broxton, Director of Planning and Technical Assistance, Partnership for Children and Youth
CALIFORNIA TEACHERS ASSOCIATION
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2015 California STEM Symposium
Designing our Future

Anaheim Convention Center | October 29-30, 2015

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Your support made it possible for close to 3,000 STEM educators from across
California and the country to come together, learn from each other, and be inspired.

California’s students thank you!
Session VII Presentations
Friday, October 30 • 10:50 a.m. – 12:05 p.m.

An Innovative Approach to Recruiting and Retaining Women in Engineering
Room #201A
Session ID: 147, Strand: 6, Grades: P, Audience: P
Cal Poly Pomona’s Women in Engineering program began in 2012 with the goal of increasing the number of women in STEM careers. Examine the strategies that the Women in Engineering program uses to recruit, retain, and graduate female engineers and discuss the successful outcomes of the program.

Cordelia Ontiveros, Ph.D., Associate Dean for Academic Programs and Student Services, College of Engineering, California State Polytechnic University, Pomona
Gerri Cole, Ph.D., Outreach Director, California State Polytechnic University, Pomona

Preparing Low Income and Minorities for STEM Careers
Room #201B
Session ID: 507, Strand: 6, Grades: HS, Audience: O
Learn how Roots of Success, an innovative, STEM-based, environmental literacy, and work-readiness curriculum, is used nationally by schools and workforce organizations to prepare low-income youth for STEM careers. Roots for Success provides individuals with pathways out of poverty and contributes to a more racially and economically diverse STEM workforce.

Raquel Pinderhughes, Ph.D., Professor of Urban Studies and Planning, San Francisco State University/Roots of Success
George Leddy, M.A., Instructor, Sustainability Institute of the LACCD

Community Collaborations and Developing STEM Teachers: Lessons Learned
Room #201C
Session ID: 364, Strand: 5, Grades: P, Audience: P
Effectively supporting STEM learning means reconsidering where such learning occurs and seeking resources beyond the classroom. Panelists discuss collaboration efforts between university and community institutions (science center, aquarium, afterschool program) for pre-service teacher training. Institutional partners will highlight successes, challenges, and evaluation findings.

James Kisiel, Professor, Science Education, California State University, Long Beach
Evelyn Serrano, ScienceLive Program Coordinator, California Science Center

Creating Truly Integrated Next Generation Science Standards and Common Core State Standards Units for Grades K-5
Room #201D
Session ID: 250, Strand: 1, Grades: 3-5, Audience: E
Experience an elementary-level lesson integrating the Next Generation Science Standards, the Common Core State Standards for Mathematics, and English-Language Arts units. Discuss the challenges involved in creating integrated lessons and units, while learning about methods for making this type of work more efficient and successful in the classroom.

Doron Markus, Science and Engineering Coordinator, San Mateo County Office of Education
Turning Toys into Tools
Room #202A
Session ID: 53, Strand: 1, Grades: MS, Audience: E
Learn how to use interactive devices such as Spheros, Ollies, and programmable toys as tools for STEM learning. Users will experience hands-on learning and explore how these devices integrate with STEM and the Common Core State Standards.
Teresa Lightle, M.A., Education Technology Coordinator, Butte County Office of Education, Center for Transforming Education

Designing a Freshmen Seminar Program to Improve Recruitment and Retention of Female Engineering Students
Room #202B
The MESA Program of San Francisco State University designed a freshmen seminar to improve recruitment and retention of female students in engineering that focuses on publicizing, mentoring, counseling, and hosting financial aid and technical workshops. In addition, peer support was provided. The results and lessons learned from ten years of implementation are shared, along with how the seminar enhanced academic success.
Nilgun Ozer, MESA Engineering Program Director, San Francisco State University

Full STEAM Ahead!
Room #203A
Session ID: 144, Strand: 2, Grades: MS, Audience: A
The Beverly Hills Unified School District had a thriving Arts program, but had a gap in its preparation for STEM majors and careers. Panelists describe the district’s three-year reorganization of curriculum and teaching staff to blend STEM and Arts programs. Information includes the district’s grades K-12 course and pathway charts, and high school internship opportunities leading to college and careers.
Jennifer Tedford, Ed.D., Chief Academic Officer, Beverly Hills Unified School District
Alexis Crane, M.A., STEM Coordinator and Teacher, Beverly Hills Unified School District

The “T” in STEM
Room #203B
Session ID: 486, Strand: 2, Grades: 3-5, Audience: C
A philosophical discussion chronicling the transformation of Shirley Lane Elementary, while becoming leaders in technology and innovation in a rural school district. Topics include an examination of wasted and misappropriated technology, urgency and a plan of action, grassroots efforts, district support, internal struggles, winning hearts and minds, and moving forward.
Robert Gonzales, STEM Teacher, Fairfax Elementary School District - Shirley Lane Elementary School
Daniel Chairez, School Counselor, Fairfax Elementary School District - Shirley Lane Elementary School

Trash-to-Fash: Recycled Fashion Show
Room #204A
Session ID: 407, Strand: 4, Grades: MS, Audience: E
Learn about global sustainability in a fashionable, cool, and intriguing way. Gather insight on how to host your school’s first recycled fashion show. Students can learn to be global stewards by supporting sustainable organizations, recycling, repurposing and reusing, and ultimately, putting on a fashion show to showcase their amazing work.
Shelly Muñoz, M.A., 7th Grade Life Science/STEM, Western Center Academy
**Maker Education From Kindergarten to Career: What’s Next for the Maker Movement**

**Room #204B**

Session ID: 549, Strand: 5, Grades: All, Audience: All

Leaders from every level of the education to career pathway will discuss how policymakers, businesses, administrators, and educators can influence what is next in the Maker movement, and how we can collaborate to inspire the next generation of innovators, entrepreneurs, and critical thinkers.

*Moderator: Blair Blackwell, Manager, Education and Corporate Programs, Chevron*

*Panelists: Trey Lathe, Ph.D., Executive Director, Maker Ed; Ann Houtman, Dean Emeritus, Industry and Technology Division, El Camino College*

*Reactor - Kathleen M. Knutzen, Ph.D., Dean, School of Social Sciences and Education, California State University, Bakersfield*

**Supporting Students’ Argumentation Writing in Science**

**Room #204C**

Session ID: 235, Strand: 1, Grades: HS, Audience: E

Learn strategies to engage students in argumentation expressed in the Common Core State Standards and the Next Generation Science Standards. Participants will experience a demonstration of how to use a Model Evidence Link diagram to support students with the following: identifying evidence from data, linking evidence to claims, and leveraging evidence to write arguments. Results from a study using the tool will be shared.

*Tara Barnhart, Lecturer, California State University, Fullerton*

*Lori Rutherford, Teacher, Whittier Union High School District*

**Saturday Engineering Buddies**

**Room #205A**

Session ID: 305, Strand: 5, Grades: MS, Audience: E

What happens when you put a team of engineers in a room with students in grades 2 and 8? A fun day of simple design-and-build activities ensues. Participants test out activities, as well as learn how to develop a collaborative partnership with the American Society of Civil Engineers.

*Phyllis Fukumoto, Junior High Science Teacher, Dale Junior High School*

*Amy Choi, K-12 Outreach Co-Chair, American Society of Civil Engineers (ASCE)*

**iPad-ography: Using iPads and Devices for More than Pictures**

**Room #205B**

Session ID: 485, Strand: 4, Grades: 3-5, Audience: E

Engage in this hands-on workshop to use photography and editing apps in new ways and come away with concrete ideas of how to incorporate photography into many science lessons using time-lapse, photo collages, movies, and more.

*Stacey Holder, Science Specialist, Pleasanton Unified School District - Fairlands Elementary School*

*Jenifer Perazzo, Science Specialist, Pleasanton Unified School District and Lawrence Berkeley Lab*

**Improving Representation in STEM Through Novel Assessment and Curricular Interventions**

**Room #206A**

Session ID: 467, Strand: 6, Grades: HS, Audience: E

Gain insight into the two-step approach used by Sacramento City College for improving student diversity and outcomes in its STEM courses. Steps include using an alternative recruiting mechanism to help attract “undecided” students and using a novel curricular intervention strategy aimed at improving skills correlated with long-term STEM success.

*Paul de Gennaro, Ph.D., Professor, Sacramento City College*
**Arts, STEM, and Teacher Preparation**

**Room #206B**

**Session ID: 387, Strand: 4, Grades: P, Audience: E**

Gain insight on how a teacher education program has infused arts and STEM education into its curriculum.

*Frederick Uy, Professor, California State University, Los Angeles*

*Teresa Wu, Distance Learning Resource Specialist, Los Angeles County Office of Education*

**NextGen ASET: Tools to Critically Examine Next Generation Science Standards in K-12 Classrooms**

**Room #207A**

**Session ID: 420, Strand: 1, Grades: MS, Audience: E**

Apply the NextGen ASET, a new National Science Foundation-funded set of tools that early field tests show may help educators unpack and deepen their understanding of the Next Generation Science Standards while applying three-dimensional learning to improve their science instruction.

*Rachelle DiStefano, Director, Center for Science Education and Research, California State University, East Bay*

*Corinne Lardy, Next Gen TARSC Project Assistant Director, Center for Science Education and Research, California State University, East Bay*

**Somis STEAM Family Nights**

**Room #207B**

**Session ID: 449, Strand: 6, Grades: 3-5, Audience: A**

Hear how Somis Union School District intentionally strengthens the connections between the school, the home, and the community through a series of STEAM Family Nights, which makes STEAM more accessible to families, demonstrates the relationship between STEAM education and future careers, and gets families and communities more involved in grades K-8 STEAM learning.

*Marcella Klein Williams, Director of Special Projects, Somis Union School District*

**Latinas in STEM: Showcasing Talent**

**Room #207C**

**Session ID: 247, Strand: 6, Grades: MS, Audience: C**

Panelists showcase diverse under-represented women in STEM careers discussing their journeys and careers, while providing advice for increasing the inclusion and participation of women in STEM fields.

*Noramay Cadena, Executive Director, Latinas in STEM Foundation*

**Digging Deeper into the Next Generation Science Standards Crosscutting Concepts**

**Room #207D**

**Session ID: 87, Strand: 1, Grades: 3-5, Audience: E**

Participants will learn how to dig deeper into the Crosscutting Concepts dimension of the Next Generation Science Standards and explore ways to tie science instruction with English-Language Arts, mathematics, and history/social science.

*Jennifer Behrmann, M.A., Coordinator, Curriculum and Instruction, Adelanto Elementary School District*
Smart Gardens Supporting STEM Learning  
**Room #208A**  
**Session ID: 390, Strand: 1, Grades: 3-5, Audience: E**  
Smart gardens provide an opportunity to use hands-on STEM skills to better understand biological processes. See specific examples using inexpensive sensors, micro controllers, and open-source software, along with optional Internet connectivity, to give students the opportunity to examine data relationships, test theories, and perform data-based experiments.  
*William Jenkins, Ph.D., Garden Coordinator, Torrey Pines Elementary School  
Cathy Isom, Science Teacher, Torrey Pines Elementary School*

Integrating the Next Generation Science Standards and STEM in the Middle School Science Classroom  
**Room #208B**  
**Session ID: 294, Strand: 1, Grades: MS, Audience: E**  
Discover how to engage all students in high-quality STEM learning by involving them in designing Project-Based solutions to real-world problems using the three dimensions of the Next Generation Science Standards (NGSS). Learn to implement STEM and the NGSS in your middle school science classroom.  
*Mary Starr, Developer, The Learning Team*

Death Finds the Mesozoic: Incorporate Next Generation Science Standards Science and Engineering Practices into Physical and Earth Science  
**Room #209A**  
**Session ID: 282, Strand: 1, Grades: HS, Audience: E**  
Learn about free multimedia resources from Howard Hughes Medical Institute to help your middle and high school students develop understanding in physical and earth science disciplinary core ideas and demonstrate competency in the Next Generation Science Standards, Science and Engineering Practices. Make cross-curricular connections to the Common Core State Standards for Mathematics and English-Language Arts with focuses on earth/space science, physics, and chemistry classrooms.  
*Nikki Chambers, M.A., NGSS Lead Teacher/Department Chair, West High School*

Badges? Maybe We Need Some Stinking Badges!  
**Room #209B**  
**Session ID: 42, Strand: 2, Grades: HS, Audience: A**  
Creating professional development that enhances the technology component of STEM and changes teacher practice is a constant struggle. Several counties are innovating with badging systems that support technology integration to enhance learning. These badges can shift practice and provide motivation for continuous learning.  
*Randy Kolset, Coordinator Educational Technology, Orange County Department of Education  
Leslie Corbett, Instructional Specialist, Orange County Department of Education*

Graphical Analysis: At the Intersection of Mathematics and Science  
**Room #210A**  
**Session ID: 393, Strand: 1, Grades: MS, Audience: E**  
Graphical analysis involving real-world data in the classroom is a powerful motivating factor for students. Several simple physical systems will be discussed, developing the exciting integration between mathematics and science. Participants will engage with these physical systems in terms of data gathering, varied graphical representations, and data interpretation.  
*Steve Pauls, Associate Professor, Fresno Pacific University  
Chris Brownell, Assistant Professor, Fresno Pacific University*
California Blueprint for Environmental Literacy: Fundamental to 21st-Century STEM
Room #210B
Session ID: 548, Strand: 2, Grades: All, Audience: E
Members of the California Environmental Literacy Task Force will share the California Blueprint for Environmental Literacy with actionable ideas for integrating environmental literacy and accessing environmental education resources into STEM and the Next Generation Science Standards, using your school campus as a hands-on sustainability lab and to access resources.

Deborah Moore, M.S., Co-Founder and Executive Director, Green Schools Initiative
Shannon Gordon, Education Programs Consultant, California Department of Education

Organizing an Engineering Boot Camp
Room #210C
Session ID: 395, Strand: 3, Grades: MS, Audience: E
See how Manteca Unified School District implemented a summer engineering boot camp for grades 6-8 that emphasized coding, robotics, 3-D printing, and engineering and design.

Stephan Unterholzner, Science Teacher, Manteca Unified School District - Sierra High School
Larry Grimes, Ph.D., Science Teacher, Manteca Unified School District - Sierra High School

STEAM All Aboard!
Room #210D
Session ID: 240, Strand: 4, Grades: 3-5, Audience: E
See how the Vallejo City Unified School District is preparing all grades K-8 students to develop their capabilities in STEAM, which are linked to global competitiveness. The STEAM model adds arts to focus on innovation and creativity that is crucial to engineering design. Learn STEAM Project-Based lessons based on the “Nugget” principle.

Lilibeth Pinpin, M.A., K-8 STEAM Coordinator, Vallejo City Unified School District
Julie Nicholson, STEAM Instructional Coach, Vallejo City Unified School District

Integrating Genetics and Statistics to Address Next Generation Science Standards and Common Core State Standards for Mathematics
Room #211A
Session ID: 428, Strand: 1, Grades: MS, Audience: E
Engage in activities from the grade 6 genetics module that incorporates statistics, and is funded through the National Science Foundation. The Reinvigorating Elementary Science through a Partnership with California Teachers (RESPeCT) professional development program at Cal Poly Pomona for elementary teachers from Pomona Unified School District employs analysis of practice around science lessons with integrated mathematics addressing the Next Generation Science Standards and the Common Core State Standards for Mathematics.

Arlo Caine, Professor, California Polytechnic State University, Pomona

Project-Based Experimental Design for the Classroom
Room #211B
Session ID: 277, Strand: 3, Grades: HS, Audience: E
Learn how the Ardusat program helps students put down the textbook and design their own science experiments as a classroom project. Ardusat will demonstrate examples of how to develop a good science experiment using Arduino microcontrollers and industry standard sensors to gather raw data, just like real scientists.

Ben Peters, Director of Engineering, Ardusat
Session VII Presentations
Friday, October 30 • 10:50 a.m. – 12:05 p.m.

The Los Angeles River: Design Thinking + Civic Participation = Change
Room #212B

Session ID: 450, Strand: 4, Grades: 3-5, Audience: E

Listen to the process, including research, prototypes, and proposals to city officials, that a grade 3 class took on as a design challenge to create inclusive and inspiring spaces along the Los Angeles River. Learn the design process and have an opportunity to create community-engaged STEM challenges relevant to local learning communities.

Evelyn Serrano, Arts Integration Coordinator, Los Feliz Charter School for the Arts
Sonny Calderon, Dean, New York Film Academy

Engineering Practices in an Elementary Classroom
Room #213A

Session ID: 132, Strand: 1, Grades: 3-5, Audience: E

What do the elementary-level science and engineering practices of the Next Generation Science Standards look like? This hands-on session has participants use their experience with an integrated engineering activity to develop a list of lesson components that may foster student engagement in engineering practices and can be applied in their own classrooms.

Jason Brewer, Professional Development Provider, Engineering is Elementary

Teacher Tools: Assessing Student Understanding in the Next Generation Science Standards Classroom
Room #213B

Session ID: 178, Strand: 1, Grades: MS, Audience: E

How can student progress toward three-dimensional mastery of the Next Generation Science Standards be measured? Receive examples and tools to create assessments and review how the three dimensions of Next Generation Science Standards are interwoven during instruction and assessment.

Mena Parmar, Elementary Science Specialist, Fremont Unified School District

Urban EcoLab: Environmental Science for the Modern City
Room #213C

Session ID: 356, Strand: 1, Grades: HS, Audience: C

Urban EcoLab is a National Science Foundation-supported, multi-media, Next Generation Science Standards-aligned interactive STEM curriculum designed to use urban ecology to teach a broad range of subjects, with a focus on environmental science. Using locally relevant field studies, Urban EcoLab has 130 lessons organized in eight modules providing flexibility in instruction and application.

Eric Strauss, President’s Professor Urban Ecology, Loyola Marymount University

Grab Your LEGO s! It’s Robotics Time!
Room #213D

Session ID: 384, Strand: 3, Grades: MS, Audience: E

Are you interested in starting a Robotics program at your school? Whether during school or out-of-school/expanded learning, the possibilities for this STEM project are endless. Strategies to support with classroom management, implementation models, connections to the Common Core State Standards, STEM partnerships, and basic building and programming skills are discussed.

Jennifer Gateley, M.A., Principal, Ontario-Montclair School District - Vineyard STEM Magnet School
Heidi Zampach, Teacher, Ontario-Montclair School District - Vineyard STEM Magnet School
Introduction

Shelly Masur
CEO of Californians Dedicated to Education Foundation

Shelly Masur is the CEO of Californians Dedicated to Education Foundation. She brings almost twenty years of successful experience working as an educational leader with youth-serving non-profits and in 2013 was named as one of the “100 Women of Influence” by the Silicon Valley Business Journal. She is currently a school board member in the Redwood City School District in San Mateo County.

Keynote Speaker

Dr. Stuart Sumida
Ph.D., Wang, Distinguished Professor of Science, Mathematics, and Engineering, California State University, San Bernardino

Stuart Sumida received his Ph.D. from UCLA in 1987 and taught in the Department of Anatomy and the Pritzker School of Medicine at the University of Chicago before coming to California State University, San Bernardino (CSUSB). He is a paleontologist and comparative anatomist, teaching animal and human anatomy. He is currently Wang Distinguished Professor of Science, Mathematics, and Engineering for the California State University System, Professor of Biology at CSUSB, Adjunct Professor of Human Anatomy at Western University of Health Sciences in Pomona, California, and DeTao Master of Anatomy and Animation at DeTao Masters Academy in Shanghai, China. He has written three books, published over 70-peer-reviewed articles on the evolution of vertebrates, and is considered the world’s foremost anatomical consultant to special effect artists and animators, having worked on over 50 feature length films. In 2011 he was named outstanding professor of the state of California by the Carnegie Foundation.

Topic: STEM AND “STEAM”, Science and Art, and the Roles of Biology and Anatomy in Animation and Cutting-edge Visual Effects

The integration of art into STEM, aka “STEAM” is a powerful vehicle for teaching, outreach, and research. Here, Stuart Sumida documents the roles of biology, anatomy, and paleontology role in helping animators and visual effects artists. These core scientific concepts not only influence character design and movement, but also key story elements as well. Sumida will track the use of fundamental scientific concepts from his career as an anatomical consultant from animated classics such as Disney’s Beauty and the Beast and Lion King, through DreamWorks’ How to Train Your Dragon, and live-action adventures such as Life of Pi and Guardians of the Galaxy.

Companies he has worked with include Walt Disney Feature Animation, DreamWorks Animation, Pixar, Warner Brothers, SONY Pictures Imageworks, MPC, Framestore, Double Negative, Disney Imagineering, Guerrilla Games, Blizzard, and others. He has spoken at dozens of STEM conferences and film festivals in North America, Asia, and Europe.

Closing Announcements

Don’t Forget…

Please complete the STEM Symposium evaluation.
The link is located on The STEM California home page at www.STEMcalifornia.org.

Your feedback is important in the planning of the 2016 conference.
Acknowledgments

A special Thank You is extended to
State Superintendent of Public Instruction Tom Torlakson,
the Californians Dedicated to Education Foundation,
the California Commission on the Status of Women and Girls,
and the California State Library,
for their support of California STEM education and making this conference a success.

Our appreciation and recognition of the following individuals and organizations for
their contributions to the success of this Symposium:

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Lupita Cortez Alcalá, Deputy Superintendent
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Thank you to all of the presenters, exhibitors, volunteers, and participants of the STEM Symposium.