A holistic, project based learning opportunity, the Cal Water H2O Challenge invites 4th-6th grade classes in the Cal Water service area to design a dynamic water conservation solution for their school and community.

**Curriculum Integration**

New Google Classroom pages include grade level specific opportunities for Common Core and NGSS integration, helping teachers integrate the project and meet their goals through project based learning.

**Customized for the Current Climate**

Whether school takes place on campus, at a distance, or somewhere in between, we have format-specific tips and tools for making the challenge work for all classes.

**Teacher Tools**

- Google Classrooms with grade-level specific resources
- Step-by-step guides
- Sample Portfolios
- Teacher tips from veteran participants
- Weekly office hours with Teacher Ambassadors

**Grand Prize:** a $3,500 classroom grant and $1,000 college scholarships for participating students

Register by November 20th for a chance to win a $500 grant.

Final Registration Deadline: 31 Jan. 2021

Learn more at: challenge.calwater.com
CASE ANNUAL MEMBERSHIP MEETING AND SOCIAL HAPPY HOUR

Join us for the CASE Annual Meeting of members presided over by the 2019-2021 president Shawna Kolmel. Learn about the work of CASE over the past year, made possible with the support of our membership. Following the member meeting, let’s virtually gather together for an informal Social Happy Hour. Grab your favorite beverage and let’s hang out!

Friday, October 16, 2020
4:30 pm – 6:00 pm
Join us on Zoom - https://bit.ly/CASEMemberMeeting
Meeting ID: 882 0345 9321

CASE ANNUAL MEMBERSHIP MEETING AND SOCIAL HAPPY HOUR

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4:30 pm – 6:00 pm
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WELCOME FROM CASE PRESIDENT

Thank you so much for attending the reimagined 2020 Virtual California Science Education Conference! On behalf of the California Association of Science Educators (CASE), our leaders and members, it is a distinct pleasure to welcome you! We know that our time in Palm Springs would have been phenomenal—the region which is known for its natural beauty and history, but also for advancements in technology and innovative spirit. So let’s harness the energy of what would have been the region we would have gathered in and combine it with the incredible intellect, creative thinking, and innovation that will be presented in the workshops, sessions, and shared by our speakers over the course of the innovative conference platform that still brings us together in these unprecedented times. This virtual meeting of energy and intellect will be the catalyst for us all to learn, grow, think, share, and better educate the students and communities with which we work each and every day. After seven months of living and working in a virtual world, we are thrilled to be able to use this platform to connect with you, learn with you, and provide you with a robust professional learning opportunity. We are also excited to experience new ways to further build relationships and community with you as we navigate these uncharted waters.

As the convener of the conference, CASE seeks to drive the science education community forward by providing resources, thought-provoking sessions, and tangible takeaways from which each and every one of us can be better partners in education. This conference is but one way that CASE seeks to support science education in California. Advocacy on your behalf, and on that of students and science education at all levels, is at the core of what we do. We seek to ensure the high-quality, equitable access to resources, curriculum, standards, assessment and funding are available for educators; we work towards fostering a community of educators and supporters who promote science and want to share perspectives, thoughts and ideas; and we want to work towards being an even greater resource of information, learning and support for you and your students.

As you attend the various aspects of the conference, please keep these things in mind:

THERE IS SOMETHING FOR EVERYONE!
The conference provides a myriad of professional learning workshops, expo hall and networking opportunities that enhance the experience and provide something for everyone. Whether this is your first time attending the conference or you are a veteran, there is something that will be interesting and valuable for you as we convene this conference in a whole new fashion. In many ways, this conference will be a first for us all. Take the time to soak it all in, but also take time to be bold and participate in the social opportunities, introduce yourself to someone new, make some new friends, and build community as we all have a lot to provide one another.

WE COULD NOT HAVE DONE THIS ALONE!
CASE is the voice of a like-minded community of educators and supporters focused on science education and through this we recognize that we are not in this alone! This conference would not be possible without the dedicated work and commitment of so many people and organizations. For many months, our conference committee has worked diligently with countless partner organizations to bring you relevant and highly qualified speakers and sessions. Please make sure to thank our keynote speakers, presenters, partners and volunteers for their commitment to the conference and science education community!

So, as you take in the robust schedule, visit the virtual exhibit hall, participate in events and activities, and make new friends, I hope that you enjoy this experience and take away inspiration, learn new things, and just have a great time. Enjoy all that the 2020 Virtual California Science Education Conference has to offer!

Shawna Kolmel
President, CASE 2019-2021
SCHEDULE AT-A-GLANCE

FRIDAY, OCTOBER 16, 2020
4:30pm – 5:00pm ............... CASE Annual Membership Meeting
5:00pm – 6:00pm ............... Virtual Conference Happy Hour

SATURDAY, OCTOBER 17, 2020
7:30am – 8:30am ............... Morning Yoga
8:30am – 9:15am ............... Welcome, Tribal Welcome and Awards Recognition
9:00am – 10:15am ............... Opening Keynote Presentation – Dr. Okhee Lee
10:15am – 10:45am .......... Virtual Conference Exhibit Tradeshow, Lounge
10:45am – 12:15pm .......... Live Workshops and Focus Speaker
12:15pm – 1:30pm .......... Virtual Conference Exhibit Tradeshow, Lounge and Lunch
1:30pm – 3:00pm .......... Live Workshops and Focus Speaker
3:00pm – 3:30pm .......... Virtual Conference Exhibit Tradeshow, Lounge
3:30pm – 5:00pm .......... Live Workshops and Focus Speaker
5:00pm – 5:30pm .......... Closing Session

SUNDAY, OCTOBER 18, 2020
7:30am – 9:00am ............... Nature Journaling
9:00am – 10:00am .......... Closing Keynote Presentation – Dr. Mayim Bialik
10:00am – 10:30am .......... Virtual Conference Exhibit Tradeshow, Lounge
10:30am – 12:00pm .......... Live Workshops and Focus Speaker
11:30am – 12:30pm .......... Virtual Conference Exhibit Tradeshow, Lounge and Lunch
12:30pm – 2:00pm .......... Live Workshops and Focus Speaker
2:00pm – 2:30pm .......... Closing Session

OCTOBER 18, 2020 – NOVEMBER 17, 2020
At Your Own Pace ............... On-Demand Workshop Sessions

CASE reserve the right to modify or cancel any of the events listed here or modify the schedule. For the most current program of events, please download the mobile app.

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WELCOME FROM CASE CONFERENCE CHAIR

What a year 2020 has been! From a pandemic, wildfires, scorching temperatures, protests against social injustices, not to mention endless hours on zoom and teaching virtually, you have all experienced and endured a great deal. Despite all this, you continue to meet your students every day with compassion and strive to be the best educators you can be. If anyone deserves the fantastic weekend we have planned, it’s you! On behalf of the 2020 Conference Committee, CASE Board of Directors and our invaluable CASE staff, it is my pleasure to welcome you, wherever you may be in the world, to the California Science Education Conference.

Though virtual, our goal remains the same: To give science educators an opportunity to grow professionally in order to improve outcomes in and access to high-quality science education for ALL students. Access and equity has never been more important for the students throughout California and the country. This weekend, you will have multiple opportunities to engage in these issues with inspiring speakers and knowledgeable workshop facilitators. We are especially excited about this year’s keynote speakers, Dr. Ohkee Lee who will open the conference on Saturday and Dr. Mayim Bialik who will close the conference on Sunday. Dr. Lee is known for advancing research, policy and practice that simultaneously promotes science and language learning for all students, particularly English language learners. Currently she leads collaborative research between New York University and Stanford University to develop instructional materials aligned with the Next Generation Science Standards (NGSS) to promote science and language learning for elementary students, including English learners. Dr. Bialik is widely known for her award-winning role as Amy Farrah Fowler on the Big Bang Theory. She also holds a doctorate in neuroscience from UCLA and is an acclaimed author of two #1 New York Times bestsellers: Girling Up: How to Be Strong, Smart and Spectacular, and the recently released Boying Up: How to Be Brave, Bold and Brilliant. Both speak with a passion and immediacy that you won’t want to miss.

Of course it wouldn’t be the California Science Education Conference without a little fun. Scattered throughout the wonderful workshops and stellar focus speakers, we have added a few ways to relax, make new friends and catch up with old ones. You might enjoy the Friday evening CASE hosted Happy Hour, Saturday morning yoga, lounge room chats, or Sunday morning nature journaling. There may even be a few surprises thrown in there, too, so be on the lookout!!

A few thank you’s are in order. Thank you to all the organizations, including K-12 Alliance, the California Science Project, informal science education centers, science and STEM colleagues representing County Offices of Education from across the state and all the teacher leaders for your collaboration and support. Thank you to our sponsors: California Water Service H2O Challenge, S.D. Bechtel, Jr. Foundation, STEMscopes, Chevron, Carolina Biological, HHMI, TCI, Twig Science and the California Teachers Association, and to our many exhibitors for your continued support during this challenging year. Finally, thank you to all the focus speakers and workshop facilitators. They didn’t blink when we asked them to reinterpret their sessions for a virtual platform either as a live session or as recorded webinars. But, hey, that’s what teachers like you do! Adjust, adapt, and overcome.

As you navigate through the virtual conference room, peruse the virtual trade show, interact with peers via breakout rooms and chat windows (and dream about being in Palm Springs), and remember that even though we are not physically together, this is an opportunity to grow our leadership, knowledge and commitment to science education for all students. Thank you for being here. Enjoy the conference.

Debbie Gordon
2020 Conference Chair

THANK YOU

Thank you for attending this year’s Virtual California Science Education Conference. CASE applauds you for taking the time out of your busy schedules and for investing in your professional learning. We hope that you find your time at the conference worthwhile and rewarding.

Planning for future CASE events will begin next month. CASE values feedback and insight from its attendees and hopes that you will take a moment to complete a conference evaluation. Evaluations are available through the Conference App and through the virtual event platform.

THANK YOU AGAIN FOR ATTENDING. ENJOY!
GENERAL SESSIONS AND KEYNOTE SPEAKERS

CASE ANNUAL MEMBERSHIP MEETING AND SOCIAL HAPPY HOUR
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4:30pm – 6:00pm
Join us on Zoom – http://bit.ly/CASEMemberMeeting
Meeting ID: 882 0345 9321

INTEGRATING STEM AND LANGUAGE WITH ALL STUDENTS, INCLUDING ENGLISH LEARNERS
Dr. Okhee Lee
Three emerging forces are shaping the landscape of STEM education: growing student diversity, increasing academic rigor of content standards, and advancing technological innovations. The convergence of broadening participation in STEM subjects through technological innovations represents the lives of students and teachers in classrooms and informal educational settings. As disciplinary practices in STEM subjects (e.g., develop models, argue from evidence, construct explanations) are language intensive, engagement in these practices presents both learning opportunities and demands to all students, especially English learners. The presentation will address contemporary perspectives on how to integrate STEM and language with all students, including English learners. Using classroom examples, this presentation will highlight the mutually supportive nature of instructional shifts in STEM learning and second language acquisition.

Saturday, October 17, 2020
9:00am – 10:15am

SCIENCE WITH A SIDE OF LAUGHTER
Dr. Mayim Bialik
A life in science inspired at an early age complemented by comedy and acting doesn’t sound like a normal path, but is exactly the experience of Dr. Mayim Bialik. Join us as Mayim shares what inspired her to pursue a career in science (as well as acting), balanced with a dose of laughter and entertainment, experiences as a woman in the field of research and what we can all do to make an impact on the future of our students.

Sunday, October 18, 2020
9:00 am – 10:00 am

CONGRATULATIONS AWARD WINNERS

Congratulations to our California Association of Science Educators 2020 Award Recipients. Please join us as we recognize the Award Recipients Saturday, October 17, 2020 at 8:30 am.

ADMINISTRATOR LEADERSHIP AWARD
Nicoie DiRanna, San Marcos High School
As an Assistant Principal, Nicoie DiRanna has been a strong advocate for science education, leading her district and teachers to set the example for neighboring districts. She continually shares her experiences with other districts, expanding her influence statewide.

MARGARET NICHOLSON DISTINGUISHED SERVICE AWARD
Karen Cerwin, K-12 Alliance/WestEd
As one of the founding members of the K-12 Alliance, Karen Cerwin has been instrumental in influencing science education and advocating for science education to be a priority in California. Throughout her career, she has inspired, encouraged, and supported countless teacher leaders, many of whom are current and past CASE (formerly CSTA) Board Members.

FUTURE SCIENCE TEACHER AWARD
Ryan Ward, Preservice Teacher, CSU Long Beach
Ryan Ward just finished his geosciences single subject credential through CSU Long Beach and plans on obtaining his physics authorization, as well. While a student at CSU Long Beach, Ryan worked at the Young Scientist Camp, planning and prepping for 40 hours of hands-on science instruction for middle school students. Ryan’s commitment to supporting his students’ learning, his growth mindset, and collaborative nature make him a prime candidate for this award.

JESSICA SAWKO TEACHER LEADERSHIP AWARD
David Tupper, Lakeside Union Elementary School District
As a TOSA, Dave has been instrumental in leading his district on their NGSS journey, as well as using his experiences to support other TOSAs across the state. He was an integral member of the CFCC during the development of the CA Science Framework, has been actively involved in numerous NGSS Rollouts, and participates in numerous statewide committees.

DISTINGUISHED CONTRIBUTIONS AWARD
Ten Strands and the California Environmental Literacy Initiative
Ten Strands and CAELI work to promote and elevate discussions that will bring environmental literacy to all of California’s K-12 students. Working through such initiatives as helping to prepare future educators by engaging in the UC/CSU Environmental and Climate Change Literacy Project and Summit (ECCLPS) and through support for the California Science Education Conference Climate Summit in 2018 and 2019, among many other project and initiatives, these organizations are paving the way for science in our classrooms and communities.
PROFESSIONAL DEVELOPMENT STRANDS

UNITS OF CREDIT FROM CSU LONG BEACH

CSU Long Beach is once again offering conference attendees an opportunity to earn a unit of upper division science education credit in conjunction with the 2020 California Science Education Conference.

Conference participants may apply for one unit of upper division credit associated with the professional learning they get through participating in conference keynote presentations, workshops, short courses, or focus speaker events. A minimum of 15 hours of session attendance during the conference (or the month after the conference by accessing the online, archived conference sessions) and a written assignment are required. This unit of credit (SCED490A) requires an additional tuition fee of $99 and course registration by December 4, 2020. Assignment information is available on the CSULB Science Education website (www.scienceteaching.org). Participants must submit their official CASE Certificate of Attendance and written assignment to Laura Henriques by December 4, 2020 and complete their registration with CSULB’s College of Professional & International Education. Credit for the course will appear before January. Assignment and registration details will be available online at www.scienceteaching.org.

The course is SCED490A: Special Topics in Science Education (this course can be repeated for a maximum of six units with different topics – so be sure you haven’t already completed six units of SCED490A at CSULB).

A. To obtain the unit of credit from CSU Long Beach You must:

- be an officially registered conference attendee (must provide a copy of your conference nametag)
- attend conference sessions totaling at least fifteen documented hours (see above for eligible sessions)
- register for the unit of credit by December 4, 2020
- electronically submit the following documents by December 4, 2020
  - CASE Certificate of Attendance (verification of attendance and participation at 15 hours worth of workshops, conference lectures, short courses, etc.)
  - Word processed written assignment [csulb.edu/scied]

Submit the written assignment and register on-line by December 4, 2020.

Only complete registration packets (registration form, CASE Certificate of Attendance and written assignment) will be eligible for course credit. Late registration and late assignments cannot be accepted. You will be contacted by CSULB to complete the registration process (payment).

Laura Henriques, Professor Science Education
CSU Long Beach
Laura.Henriques@csulb.edu

CERTIFICATE OF COMPLETION FROM CASE

CASE will provide an electronic certificate of attendance/completion listing the complete workshop hours to any registrant completing and submitting the session survey for each workshop attended. Certificate of attendance will be added to your ebag in the virtual event platform.
SESSION LEGEND

SCIENCE
To enhance your conference experience, most of the sessions specify the topic area, or science, that is emphasized in the session content. Conference attendees may follow one track for an in-depth, content-rich focus on one particular science topic, or may pick and choose among tracks to sample the full complement of conference offerings.

The following tracks are offered at this year’s conference:
- All Sciences
- Chemistry
- Climate
- Earth/Space Science
- Engineering
- Environmental Science
- Integrated Science (Bundled Across Domains)
- Life Science/Biology
- Physical Science
- Physics

EMPHASIS
Most sessions are also designated with an emphasis category. This designation is designed to help you determine the emphases in science education the course will take. The emphasis categories are as follows:
- Assessment
- Beef Up on Content
- Classroom Management/Engagement
- Climate
- Common Core – Math
- Common Core – Literacy
- Computer Science in Science
- Crosscutting Concepts (CCCs)
- Disciplinary Core Ideas (DCIs)
- English Learner/English Language Development (EL/ELD)
- EP&Cs/Environmental
- Informal Science in Education Literacy
- Leadership – Coaching, Site Leadership, Administrator, Professional Development (Leadership)
- Pedagogy
- Preservice Teacher Education/TPAs
- Science & Engineering Practices (SEPs)
- STEM/STEAM/MAKER
- Technology Integration
- TOSA/Science Coach

SCHEDULE-AT-A-GLANCE

SATURDAY, OCTOBER 17, 2020

7:30am – 8:30am ...............Focus Speaker: Mary Ann Ng: Yoga for Desk Pain
8:00am – 5:00pm ...............Virtual Conference Exhibit Tradeshow Open
8:30am – 9:00am ...............Welcome
Debbie Gordon, 2020 CASE Conference Chair: Welcome and Tribal Introduction
Shawna Kolmel, CASE President: Welcome, Awards Recognition and Opening Keynote Introduction
Brooks Dougherty, STEMscopes: Welcome from Platinum Sponsor
9:00am – 10:15am ..........Opening Keynote Presentation: Dr. Okhee Lee
10:15am – 10:45am ..........Exclusive Hours: Virtual Conference Exhibit Tradeshow and Lounge
10:45am – 12:15pm ..........Concurrent Live Workshops and Exhibitor Workshops
10:45am – 12:15pm ..........Focus Speaker: Dr. Sami Kahn: It Takes a (Collaborative) Village: Three Approaches to Supporting Inclusive Science Education
12:15pm – 1:30pm ..........Exclusive Hours: Virtual Conference Exhibit Tradeshow and Lounge
1:30pm – 3:00pm ..........Concurrent Live Workshops and Exhibitor Workshops
1:30pm – 3:00pm ..........Focus Speaker: Jose Gonzalez, Latino Outdoors: Race, Culture, and Outdoor Equity for Science Instruction
3:00pm – 3:30pm ..........Exclusive Hours: Virtual Conference Exhibit Tradeshow and Lounge
3:30pm – 5:00pm ..........Concurrent Live Workshops and Exhibitor Workshops
3:30pm – 5:00pm ..........Focus Speaker: Dr. Bryan Brown: The Meaning Beyond the Words: How Language, Race, & Culture Impact Science Teaching & Learning
5:00pm – 5:30pm ..........Closing Session and Raffle – Peter A’Hearn, President-Elect

INTEGRATING STEM AND LANGUAGE WITH ALL STUDENTS, INCLUDING ENGLISH LEARNERS

Dr. Okhee Lee

Three emerging forces are shaping the landscape of STEM education: growing student diversity, increasing academic rigor of content standards, and advancing technological innovations. The convergence of broadening participation in STEM subjects through technological innovations represents the lives of students and teachers in classrooms and informal educational settings. As disciplinary practices in STEM subjects (e.g., develop models, argue from evidence, construct explanations) are language intensive, engagement in these practices presents both learning opportunities and demands to all students, especially English learners. The presentation will address contemporary perspectives on how to integrate STEM and language with all students, including English learners. Using classroom examples, this presentation will highlight the mutually supportive nature of instructional shifts in STEM learning and second language acquisition.

SATURDAY, OCTOBER 17, 2020 | 9:00AM – 10:15AM
SATURDAY FOCUS SPEAKERS

Focus speakers are highly regarded scientists and education experts who present 90-minute, in-depth sessions on subjects relevant to science teaching. The focus speaker series allows you to expand your understanding in a wide range of critical topics. Focus speaker sessions are included with your conference registration.

**Saturday, October 17 • 7:30am - 8:30am**

**FOCUS SPEAKER**

Mary Ann Ng, Yoga Instructor, Alhambra High School

Feeling any lower back, neck, and shoulder pain from all those long hours of synchronous distance learning? Join me for an hour of therapeutic yoga. You will feel energized and equipped with tools that you can use to deal with the discomfort of teaching online.

**Saturday, October 17, 2020**
7:30am – 8:30am

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**FOCUS SPEAKER**

It Takes a (Collaborative) Village: Three Approaches to Supporting Inclusive Science Education

Dr. Sami Kahn, Deputy Director, Council on Science of Technology Princeton University

Dr. Michele Koomen, Research Professor, Gustavus Adolphus College

Dr. Jonte’ C. Taylor, Associate Professor of Special Education, Pennsylvania State University

During this session, Dr. Sami Kahn will address the essential role that collaboration among science educators, special educators, and others has had in her journey as an educator, parent, and attorney. She and her colleagues, Dr. Michele Koomen and Dr. Jonte’ Taylor, will then lead participants through mini-master classes focusing on three critical topics of inclusion and collaboration: strengths-based teaching, disciplinary literacy, and assessment, drawing from their book, Towards Inclusion of All Learners through Science Teacher Education.

**Saturday, October 17, 2020**
10:45am – 12:15pm

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**SATURDAY**

**Saturday, October 17 • 10:45am - 12:15pm**

**Bringing Artificial Intelligence and Algorithmic Thinking to the Classroom**

Hall Davidson, Discovery Education

We do students a disservice by not introducing AI understanding into education. Learn strategies, hurdles, and resources for AI integration (and digital assistants) and algorithmic thinking. Free Resources, nuts and bolts examples for building understanding of AI and algorithmic thinking.

- Science: Earth/Space Science, Engineering, Integrated Science (Bundled Across Domains)
- Grade Level: 3-12
- Emphasis(es): Crosscutting Concepts (CCCs), Informal Science Education, Technology Integration

**Carolina 3D Chemistry: Flexibility Without Compromise**

Felicia Cherry, Carolina Biological Supply Company

DeeDee Whitaker, Carolina Biological Supply Company

Examples of hands-on investigations, digital investigations, and digital teacher demonstrations from the Carolina 3D Flex kit lines will be shared with teachers as they participate in four chemistry activities that illustrate how in-class, hands-on laboratory investigations have been modified by Carolina for use in socially-distanced classrooms and remote learning settings.

- Grade Level: 9-12

**Carbon’s story: From Smokestacks to Trees to Bottom of Seas**

Olivia Allison, San Diego Unified

Yassir Eddebbar, Scripps Institution of Oceanography, UC San Diego

Human activity has slowed due to a pandemic. Will it make a difference in carbon dioxide levels on Earth? Get a lesson sequence that explores carbon cycling and online-based satellite data visualization tools to look for patterns in carbon levels.

- Science: Chemistry, Climate, Earth/Space Science, Environmental Science, Life Science/Biology, Physical Science
- Grade Level: 6-12
- Emphasis(es): Climate, EP&Cs/Environmental Literacy, Technology Integration
Experience Stoichiometry: Using Multiple Representations to Discover the Mole Ratio
Chris Moore, University of Nebraska Omaha
Experience Chemistry takes a “radical” approach to teaching stoichiometry by building understanding through multiple representations – forcing students to understand ratios as opposed to “using” equations. Learn how to combine California NGSS and Common Core Math to construct understanding.

Science: Chemistry
Grade Level: 9-12
Emphasis(es): Common Core-Math, Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

Four Major NGSS Implementation Lessons from the Early Implementer Districts
Karen Cerwin, WestEd, K-12 Alliance
Burr Tyler, WestEd
Brid Schleder, Kings Canyon, Unified School District
In the CA K-8 NGSS Early Implementers Initiative, eight districts have been working for six years to achieve districtwide NGSS implementation. We’ll share four of the main lessons learned about districtwide NGSS implementation from the 6-year effort.

Science: Earth/Space Science, Engineering, Life Science/Biology, Physical Science
Grade Level: TK-8
Emphasis(es): Leadership (Coaching, Site Leadership, Administrator, Professional Development), Pedagogy, TOSA/Science Coach

Getting STEAMy with Salibots
Erin Dunroe, Little Lake City School District
Carrie Winn, Kreaer Middle School
Are you looking for a way to incorporate science, technology, engineering, art and math all in one project? Then this is the session for you! In this session you will be the student; designing and creating your own sailboat.

Science: Engineering, Physical Science
Grade Level: 3-8
Emphasis(es): Pedagogy, Science & Engineering Practices (SEPs), STEM/STEAM/Maker

How do you assess NGSS? Developing Meaningful Rubrics
Nathan Inouye, Ventura County Office of Education
Anna Babarinde, Sonoma County Office of Education
How do you assess 3-dimensional learning in the classroom? Participants will have the opportunity to learn about different types of rubrics and will include an opportunity to apply and reflect on how a rubric can provide meaningful feedback to students.

Science: Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: TK-12
Emphasis(es): Assessment

Inspiring Student Questions with a TWIST in DNA Modeling
Karen Avery, Biology Instructor, The Pennsylvania College of Technology
Dan Williams, 3D Molecular
Hands-on modeling kits to allow students to discover the molecular intricacies of DNA anatomy, replication, transcription and translation, inspiring curiosity, questions, and discussion.

Science: Life Science/Biology
Grade Level: 9-12
Emphasis(es): Beef Up on Content, Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

Low Floor, High Ceiling: Making Science Tasks More Spacious
Clea Matson, California Academy of Sciences
Amelia Rosenman, California Academy of Sciences
Low Floor, High Ceiling experiences are those with BOTH easy access points AND the potential for expansive thinking for all learners. Come explore how using this lens can help you make small changes that drastically improve your existing science curriculum.

Science: Chemistry, Physical Science
Grade Level: TK-12
Emphasis(es): English Learner/English Language Development, Pedagogy, Science & Engineering Practices (SEPs)

Mathematics and Computational Thinking with HHMI: Authentic Data and Practices
Jim Clark, HHMI BioInteractive
Samantha Johnson, HHMI BioInteractive
Start highlighting the practice of mathematics and computational thinking! See how to authentically integrate this SEP into your classes. We’ll utilize BioInteractive resources that allow students to engage in traditional and less traditional ways, including data analysis, infographics and more.

Next Generation Science Fairs, STEM Expos, & Family Science Nights
Robyn Stone, Synopsys Silicon Valley Science & Technology Outreach Foundation
Showcase the amazing NGSS aligned, project-based learning, and interdisciplinary STEM studies at your school with a re-imagined science fair, STEM expo, or family science night. Learn tips on running a successful program, engaging families, and finding community education partners.

Science: Integrated Science (Bundled Across Domains)
Grade Level: TK-8

P51™ Glow Labs: DNA Structure and Enzyme Activity Through Fluorescence
Ally Huang, miniPCR bio
Using fluorescence, you will directly visualize the effects of temperature, pH, and genetic sequence on DNA structure and hydrogen bonding. Experimentally test how inhibitors, concentration, temperature, and pH affect the rate of enzymatic reactions.

Science: Life Science/Biology
Grade Level: 7-12
Emphasis(es): STEM/STEAM/Maker, Technology Integration

Productive Student Discourse: What are They Talking About?
Marian Murphy-Shaw, Siskiyou County Office of Education
Learn what makes student talk a productive part of positive classroom culture by practicing with strategies you can use to teach and reflect! • Deepen your understanding of the benefits of productive discourse. • Experience processes, tools, and activity-based investigations.

Science: Integrated Science (Bundled Across Domains)
Grade Level: 3-12
Emphasis(es): Classroom Management/Engagement, Leadership (Coaching, Site Leadership, Administrator, Professional Development), Pedagogy
**Saturdays**

**Saturday, October 17 • 10:45am - 12:15pm**

**Slow Your Roll: Building Intuition About Motion**
Tammy Cook-Endres, Exploratorium
Marc ’Zeke’ Kossover, Exploratorium
Desiré Whitmore, Exploratorium

Using a novel piece of apparatus that you can build, we’ll show you a way to help students understand changing velocities that bridges the gap between qualitative and quantitative by tearing up their measuring tools.

Science: Physical Science, Physics
Grade Level: 6-12
Emphasis(es): Classroom Management/Engagement, Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

**STEMscopes HelpDesk: Get Assistance on Everything**
Kenn Heydrick, EdD, STEMscopes
Lloyd Martinez, STEMscopes
Brooks Dougherty, STEMscopes
Sean Timmons, STEMscopes
Kristin Majda, STEMscopes

If you’re using STEMscopes in the online or on-site classroom setting, this session is for you. Come meet the team behind the digital curriculum during this virtual open-house with help-desk breakout rooms. Stop by to catch quick tips, have your questions answered, check out the new additions to STEMscopes, and much more! We are here to help.

Science: Chemistry, Earth/Space Science, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: TK-12
Emphasis(es): Assessment, Pedagogy, Technology Integration

**Students With Abilities in Science! Focus on Special Education**
Leena Bakshi, STEM 4 Real
Debbie Sharp, Who’s Learning Now

Science-based student-centered instruction can embrace the specific needs of students with special needs. Learn how to create accommodations for each of your students and walk away with a completed lesson that meets the diverse needs of students with all abilities!

Science: Chemistry, Integrated Science (Bundled Across Domains), Physical Science
Grade Level: TK-12
Emphasis(es): Leadership (Coaching, Site Leadership, Administrator, Professional Development), Pedagogy, TOSA/Science Coach

**TOSAs Toolkit for Working with Others**
Erica Young, Culver City Unified

Attain resources to support stakeholders in NGSS implementation: Communicating to parents, considerations when providing professional development to teachers, tools to support growth around SEPs for coaches, and resources for administrators to help understand NGSS and provide resources to support teachers.

Science: Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science
Grade Level: TK-12
Emphasis(es): Leadership (Coaching, Site Leadership, Administrator, Professional Development), TOSA/Science Coach

**Welcome to the New Frontier Virtual Reality in the Classroom**
Mark Wakita, Red Hill Lutheran School

Using Virtual Content with Online Instruction
Conducting classes online still presents opportunities for students to explore with virtual environments. In this section, we’ll look at opportunities available to online teachers to allow their students to see phenomena and explore via virtual field trips. Online teachers can guide their students through this content using existing student computing resources.

Introduction to Augmented Reality for Face-to-Face and Online Classrooms.

Similar to virtual reality, augmented reality presents an opportunity to expand the learner’s world through digital technology. Tools that can be used in class and online will be discussed and teachers will have the opportunity to evaluate the technology themselves.

Science: Climate, Earth/Space Science, Environmental Science, Life Science/Biology
Grade Level: 5-8
Emphasis(es): Classroom Management/Engagement, Disciplinary Core Ideas (DCIs), Technology Integration

**Using Google Earth Projects for Student Created Projects.**
Lynn Reed, Bullis Charter School

In this workshop you will create your own Google Earth Tour. We will also discuss ways to use it in the elementary, middle and high school classrooms. We will also share data and project examples from our remote learning experience.

Science: Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology
Grade Level: 3-12
Emphasis(es): EP&Cs/Environmental Literacy, STEM/STEAM/Maker, Technology Integration
Administrators Leading the Way: Equity in K-8 Science

Jose Gonzalez, Creative, Facilitator, Educator, Latino Outdoors

This session will be an exploration and framing of "diversity, equity, and inclusion" relating to science instruction, with consideration of outdoor settings. We will discuss the role and impact of "cultural relevancy" and systemic inequities on learner agency while also stressing how constructs such as race matter. This is not purely in the context of the indoor classroom and instruction, but also in the outdoors as a platform of instruction and given the larger sociocultural contexts of student’s lives.

Saturday, October 17, 2020

1:30pm – 3:00pm

Animal Corridors: Empowering Students through Engineering and Environmental Challenges

Michele Korb, California State University, East Bay

Real-time video interaction with "animal ambassadors" provides relevant motivation for understanding animal corridors. Participants will view curriculum that builds empathy and engages an engineering design problem: preserving animal corridors. This interdisciplinary unit illustrates the 3 dimensionality of the NGSS.

Science: Environmental Science, Integrated Science (Bundled Across Domains)
Grade Level: 3-8

Assessing NGSS with Standards Based Grading

Becky McKinney, San Pasqual High School

Come see how a science department has shifted to standards based grading in order to develop assessments and promote equity in the classroom. Examples of assessments and rubrics will be provided.

Science: Chemistry, Earth/Space Science, Engineering, Integrated Science (Bundled Across Domains), Life Science/Biology, Physics
Grade Level: 6-12
Emphasis(es): Assessment, Science & Engineering Practices (SEPs)

BioBits™: Making Molecular Biology Visible with Easy Cell-free Experiments

Ally Huang, miniPCR bio

With minimal equipment and a quick protocol, you will use BioBits™ cell-free technology to visualize transcription and translation in real-time through fluorescence. This activity serves as an excellent interactive tool for learning the central dogma of molecular biology.

Science: Life Science/Biology
Grade Level: 8-12
Emphasis(es): STEM/STEAM/Maker, Technology Integration

Biology Distance Learning with HHMI BioInteractive

Mary Wueth, Sydney Bergman, Samantha Johnson, HHMI BioInteractive

HHMI BioInteractive features high-quality online resources designed to inspire your students to think like scientists. Come see some favorites and learn how to adapt and use these resources during distance learning with your students.

Bugs? Bugs? Using Community Science and Crafting for Creative Learning

Alyssa Bjorkquist, California State University, Long Beach

Hear from an informal education experts about ways you can incorporate community science and purposeful crafting into fun, engaging (& NGSS-aligned) lessons! You will learn to use iNaturalist, engage with the outdoors, & engineer an insect using upcycled materials.

Science: Engineering, Environmental Science, Life Science/Biology
Grade Level: 3-5
Emphasis(es): Informal Science Education, STEM/STEAM/Maker, Technology Integration

Cleaning Up Chemical Wastes

Mark Koker, Lab-Aids

Toby Chou, Lab-Aids

Chemicals and chemical reactions are used to make and power useful products but they also create waste. How can our understanding of science and engineering improve product design and methods to clean up waste?

Science: Chemistry, Physical Science
Grade Level: 6-8
Emphasis(es): Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

Designing at the Margins: Ideating District Science Policies

Vanessa Lujan, University of California, Berkeley
Sarah Pedemonte, University of California, Berkeley

Come and engage in a thoughtful discussion and ideation on how we can interrupt district systems and structures in order to ensure consistent, high-quality science for all students.

Science: Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: TK-12
Emphasis(es): English Learner/English Language Development, Leadership (Coaching, Site Leadership, Administrator, Professional Development), TOSA/Science Coach
SATURDAY

Saturday, October 17 • 1:30pm - 3:00pm

Doing the TIME: Making Meaning or Getting Through
Heidi Espindola, Placer County Office of Education

The TIME process is rich and complex but can be difficult to navigate. Join us in examining the pitfalls and opportunities we have experienced in the TIME process so that you can help teachers gain a deeper understanding of NGSS.

Science: Earth/Space Science, Engineering, Life Science/Biology, Physical Science
Grade Level: TK-12
Emphasis(es): Leadership (Coaching, Site Leadership, Administrator, Professional Development), Pedagogy, TOSA/Science Coach

Language Matters: Developing Literacy Through Science Instruction
Karen Cerwin, WestEd

Deborah Schneider, Tracy Unified School District
Participants will explore and discover how to design explicit language connections in science instruction. Grounded in theory and deep expertise in classroom practice, the methods used in this session support English language development and academic discourse for all students.

Science: Physical Science
Grade Level: 3-12

My Favorite Models: Models That Go the Extra Mile
Kim Parfitt, 3D Molecular Designs
Kris Herman, 3D Molecular Designs

Discover how teachers fawn over certain models for their Swiss Army knife flexibility and utility in engaging students throughout all units of instruction. You’ll learn which stories the models work well with, plus practical activities to reveal student learning.

Science: Integrated Science (Bundled Across Domains)
Grade Level: 8-12
Emphasis(es): Classroom Management/Engagement, Crosscutting Concepts (CCCs), Pedagogy

Making Learning Observable Using NGSS Evidence Statements
Pam Schaffer, Alameda County Office of Education
Dawn O’Connor, Alameda County Office of Education

NGSS Evidence Statements contain observable features articulating how students use the SEPs to demonstrate understanding of the DCIs through the lens of the CCCs. Learn how these observable features can guide and inform 3D teaching and learning in your classroom.

Science: Life Science/Biology
Grade Level: TK-12
Emphasis(es): Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), Pedagogy

Promoting STEM Pedagogy for Preservice Elementary Teachers in After-School Programs
Adam Devitt, CSU Stanislaus
Kristin Brooks, Ceres USD

This workshop models an afterschool STEM program as a collaborative partnership between an elementary school and a teacher education program. The program mutually enriches students in STEM learning and future teachers in STEM pedagogy. Participants will experience an example activity.

Science: Engineering, Integrated Science (Bundled Across Domains)
Grade Level: TK-5
Emphasis(es): Pedagogy, Preservice Teacher Education/TPAs, STEM/STEAM/Maker

Science Integration Strategies for K-5 Teachers
Megan Sulsberger, CSU Monterey Bay
Stephanie Shield, Accelerate Learning Inc.

Primary teachers play a critical role in helping K-5 students develop a solid science foundation before middle school, yet many feel overwhelmed with when and how to integrate the NGSS. Come explore strategies for tucking NGSS in throughout your day.

Science: Integrated Science (Bundled Across Domains)
Grade Level: TK-5
Emphasis(es): Classroom Management/Engagement, Leadership (Coaching, Site Leadership, Administrator, Professional Development), Pedagogy

Supporting English Language Development (ELD) in NGSS-Based Science Curriculum
Kenn Heydrick, EdD, STEMscopes/Accelerate Learning
Kassie Mendes, Accelerate Learning Inc.
Veronica Burnett, STEMscopes CA-NGSS Accelerate Learning

Engage in online and on-site strategies to help your ELD population make sense of science concepts and apply their science knowledge to real-world applications. We will explore a variety of support systems for ELs & LTELs, while simultaneously implementing NGSS for all levels of students.

Science: Chemistry, Earth/Space Science, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: TK-8
Emphasis(es): Common Core-Literacy, English Learner/English Language Development

The Art of Storytelling in Science
Tamara Basepayne, San Joaquin County Office of Education
Marcus Sherman, Stockton Unified School District

This workshop introduces teaching science concepts through storytelling. Using a storyline in science drives motivation, student-centered learning and sense making. Experience a hands-on physics storyline using a zombie apocalypse to learn essential physics concepts and engineering skills to survive.

Science: Engineering, Physics
Grade Level: 3-12

The Carbon Underground: Soil Regeneration for CO2 Drawdown
Linda Preininger, Elementary Science Partnership

Food quality flows from the biodiversity at our feet. Earthworms are yucky? Think again! Healthy soil stores lots of H2O and draws tons of CO2 right out of the atmosphere. Let’s explore how this happens!

Science: Environmental Science
Grade Level: 7
Emphasis(es): Crosscutting Concepts (CCCs), English Learner/English Language Development, EP&Cs/Environmental Literacy
The Stoichiometry of Climate Change: Carbon in Earth’s System
Peter A’Hearn, K-12 Alliance @ WestEd
William Grover, UC Riverside Bourns College of Engineering

What does chemistry have to do with climate change? Everything! Learn how carbon changes form in Earth’s closed system. Compare fuels for carbon output and evaluate geo-engineering solutions using math based chemistry.

Science: Chemistry, Climate, Earth/Space Science
Grade Level: 9-12
Emphasis(es): Beef Up on Content, Climate, Pedagogy

Using NGSS-Aligned Lessons to Promote Cultural Responsiveness and Diversity
Dr. Nancy Nasr, Granada Hills Charter High School
Dr. Leena Bakshi, STEM4Real

Stereotypical images of scientists hinder diverse students from envisioning the positive contributions they can make to science. Providing diverse students with opportunities to engage in science through the NGSS promotes cultural responsiveness and emphasizes the contributions of diverse scientists.

Science: Chemistry, Climate, Earth/Space Science, Environmental Science, Integrated Science (Bundled Across Domains), Physical Science
Grade Level: 9-12
Emphasis(es): Climate, English Learner/English Language Development, Pedagogy

FOCUS SPEAKER
The Meaning Beyond The Words: How Language, Race, & Culture Impact Science Teaching & Learning
Dr. Bryan Brown, Associate Professor, Stanford University

This presentation explores how race, culture and language intersect to create the condition of contemporary learning. For years, research on the language of classrooms explored how they way we say things impacts students’ sense of belonging. Despite this research, Science and Technology Education have failed to adequately explore how issues of race, language, and culture shape the outcomes of teaching and learning in science. Through a sequence of research, this presentation explores the theoretical and pragmatic aspects of this dilemma. From a theoretical perspective, the talk will explore the Language-Identity dilemma. As students learn, the way academic language is taught to them can present a cognitive and cultural conflict. From a cognitive perspective, if science is taught without respect to the implications of how language is learned students can be misunderstood and misunderstand the teacher’s complex discourse. From a cultural conflict perspective, students’ may feel they are cultural outsiders when the language of the classroom positions them as outsiders. The presentation provides an overview of a series of qualitative and quantitative experiments that document the realities of this complex interaction.

Saturday, October 17, 2020
3:30pm – 5:00pm

Addressing our Climate Crisis through Critical Literacy: An Interdisciplinary Approach
Breanna Couffer, California State University, Long Beach
Lisa Martin, California State University, Long Beach
Amy Ricketts, California State University, Long Beach

Participants will engage in an interdisciplinary, NGSS-aligned lesson on Ocean Acidification- as an effect of Climate Change- that utilizes empirical data explored in the Science classroom to reground critical literacy practices that their students experience in the ELA classroom.

Science: Climate, Earth/Space Science, Environmental Science, Life Science/Biology, Physical Science
Grade Level: 9-12
Emphasis(es): Climate, Crosscutting Concepts (CCCs), EP&Cs/Environmental Literacy

ALL Elementary Teachers are STEM Teachers!
Lesley Gates, Fresno County Superintendent of Schools

The struggle to find time to teach all content areas is real! Come experience the learning impact of a standards-driven STEM lesson that utilizes the true integration of all four STEM components. #beyondMakerspace

Science: Earth/Space Science, Engineering, Life Science/Biology, Physical Science
Grade Level: TK-5
Emphasis(es): Pedagogy, STEM/STEAM/Maker

CRISPR Science - from Editing the Human Genome to Coronavirus
Tim Herman, PhD, MSOE Center for BioMolecular Modeling (CBM)
Kris Herman, 3D Molecular Designs

We will focus on the defining feature of CRISPR technology – the ability of the Cas9 endonuclease to find and cut DNA at a unique site in the 3.2 billion base-pair human genome. We will also explore CRISPR-based coronavirus diagnostics.

Science: Life Science/Biology
Grade Level: 9-12
Emphasis(es): Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)
Genes in Space: Your DNA experiment on the space station!

Katy Martin, miniPCR bio

Genes in Space engages students in grades 7–12 in solving space biology challenges through biotechnology innovation. Winners launch their experiments to the International Space Station (ISS). Come try out the same biotechnology astronauts use aboard the ISS.

Science: Life Science/Biology
Grade Level: 7-12
Emphasis(es): STEM/STEAM/Maker, Technology Integration

Let them build it! How to Amplify Sound Waves!

Susan Singh, Farmdale

Don’t be intimidated by giving students the actual ability to engineer and build a project. Learn to let go and give the students the freedom to explore and build. They will inspire and surprise you!

Science: Engineering, Physical Science
Grade Level: 1-12
Emphasis(es): Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs), STEM/STEAM/Maker

Operation Healthy Air: Learning & Taking Action in Our Communities

Mary Walls, Environmental Education Collaborative

Mark Chandler, Earthwatch Institute

Linda Braatz Brown, Action Driven Inquiry

How was air quality affected by C19 stay at home measures? Engage in a learning sequence that gives learners access to local data. By developing questions and designing investigations, learners can take informed action in their communities.

Science: Climate, Environmental Science
Grade Level: 6-12

Fire Tornadoes: An Aligned NGSS Chemistry Unit with a Spin

Robert Terrill, San Marcos USD

Crystal Kreisel, San Marcos USD

Engage students with a fire tornado demonstration! Use fire tornadoes as an anchoring phenomenon with investigative phenomena that students can use to create a culminating model of how fire tornadoes are formed.

Science: Chemistry, Earth/Space Science
Grade Level: 9-12
Emphasis(es): Disciplinary Core Ideas (DCIs), Pedagogy, Science & Engineering Practices (SEPs)
SATURDAY

Saturday, October 17 • 3:30pm - 5:00pm

Science and Tech-Knowledge-y: Reaching 21st Century Learners
Christina Miramontes, Palm Springs Unified
Caitlyn Peterson, Palm Springs Unified
Experience several digital strategies and tools in a fun, engaging, accessible way for the TK-8 student to showcase their understanding of a science phenomenon in a digital world, including resources for digital publishing and integration of literacy and ELD.

Science: Integrated Science (Bundled Across Domains)
Grade Level: TK-8

Survival of the Fittest: Three-dimensional Learning in the Elementary Classroom
Kelsey Moore, TCI
Nathan Wellborne, TCI

Science: Life Science/Biology
Grade Level: 3-5
Emphasis(es): Assessment, Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs)

Talk, Write, Draw: Tools for Meaning-Making in Science
Sarah Soule, California Academy of Sciences
Talking, writing, and drawing are powerful tools that help students make sense of science and take ownership of their learning. Join us to explore strategies that work in online or in-person settings.

Science: Earth/Space Science, Life Science/Biology, Physical Science
Grade Level: 3-8
Emphasis(es): Pedagogy, Science & Engineering Practices (SEPs)

Universal Access and Equity to Phenomena for All!
Contessa Akitunji, Twig Education, Inc
Access to STEM learning and careers is still limited for youth from historically under-represented backgrounds. This workshop looks at innovative approaches towards equitable pathways into STEM built into the NGSS science program Twig Science.

Science: Engineering, Environmental Science, Integrated Science (Bundled Across Domains)
Grade Level: TK-8
Emphasis(es): English Learner/English Language Development, Informal Science Education, Pedagogy

Using Maker Experiences to Access NGSS and Integrated ELD Learning
Anna Babarinde, Sonoma County Office of Education
Jenn Guerre, Sonoma County Office of Education
Matt O’Donnell, Sonoma County Office of Education
Making has the power to authentically engage ELs while building language proficiency. Come engage in discussion and activity to develop a deeper understanding of how to pair NGSS-aligned maker lessons with Integrated ELD strategies to engage and support English learners.

Science: Earth/Space Science
Grade Level: TK-6
Emphasis(es): English Learner/English Language Development, Pedagogy, STEM/STEAM/Maker

Using Phenomena to Engage Students and Make Learning Relevant
Kristin Majda, Accelerate Learning
Stephanie Shield, STEMscopes CA-NGSS Accelerate Learning
The CA Science Framework encourages teachers to swap out generic phenomena for local phenomena. Come learn what makes good phenomena so you can customize your lessons to your students regardless of what curriculum you are using. We’ll also discuss the three types of phenomena (everyday, investigative, and anchoring) and practice framing guiding questions using crosscutting concepts in this fun, hands-on workshop that will use examples of literature, photos, video, and hands-on discrepant events! We’ll be raffling off a few fun phenomena too!

Science: Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: TK-12
Emphasis(es): Classroom Management/Engagement, Crosscutting Concepts (CCCs), Pedagogy

STEMscopes Bring Science Alive!

✔ Build for NGSS
✔ Hands-on Investigations
✔ Phenomena-rich Program
✔ Step-by-step Lesson Plans

See us in action at our live sessions and visit our booth to chat with our friendly staff!
SESSION LEGEND

SCIENCES
To enhance your conference experience, most of the sessions specify the topic area, or science, that is emphasized in the session content. Conference attendees may follow one track for an in-depth, content-rich focus on one particular science topic, or may pick and choose among tracks to sample the full complement of conference offerings. The following tracks are offered at this year’s conference:

All Sciences
Chemistry
Climate
Earth/Space Science
Engineering
Environmental Science
Integrated Science (Bundled Across Domains)
Life Science/Biology
Physical Science
Physics

EMPHASIS
Most sessions are also designated with an emphasis category. This designation is designed to help you determine the emphases in science education the course will take. The emphasis categories are as follows:

Assessment
Beef Up on Content
Classroom Management/Engagement
Climate
Common Core – Math
Common Core – Literacy
Computer Science in Science
Crosscutting Concepts (CCCs)
Disciplinary Core Ideas (DCIs)
English Learner/English Language Development (EL/ELD)
EP&Cs/Environmental
Informal Science in Education Literacy
Leadership – Coaching, Site Leadership, Administrator, Professional Development (Leadership)
Pedagogy
Preservice Teacher Education/TPAs
Science & Engineering Practices (SEPs)
STEM/STEAM/MAKER
Technology Integration
TOSA/Science Coach
Sunday, October 18 • 7:30am - 9:00am

**FOCUS SPEAKER**

**How to Teach Nature Journaling: Curiosity, Wonder and Attention**

John Muir Laws, John Muir Laws

Emilie Lygren, John Muir Laws

Nature journaling is a powerful learning tool that leads students to make deep observations, remember what they notice, think critically, and build a sense of place. Come learn how to make nature journaling a seminal practice in your classroom integrating science, mathematics, and visual and language arts, and building environmental literacy. Workshop leaders will offer strategies for managing students in the outdoors and online, connecting to NGSS, and giving feedback on student journals.

The class will give participants a foundation in nature journaling as a practice, how it supports learning, and how they can implement it in their classrooms. The workshop will be based on material from How to Teach Nature Journaling, co-authored by presenters John Muir Laws and Emilie Lygren (available as a free download here: https://johnmuirlaws.com/product/how-to-teach-nature-journaling/).

Participants will need a pencil, a journal or piece of paper, or two different leaves from two different kinds of plants. (this could be from any kind of plant, including vegetables from your fridge, or a photograph of a leaf).

Sunday, October 18
7:30am - 9:00am

Sunday, October 18 • 10:30am - 12:00pm

**FOCUS SPEAKER**

**Integrating Science Learning & Language Acquisition: Creating Opportunities for Multilingual Learner Achievement in the era of NGSS**

Susan Gomez Zwiep, CSU, Long Beach

Claudio Vargas, Sci-Lingual Education

Language develops most powerfully when it is in the context of building knowledge and interacting with the world. The intersection of science and ELD instruction lands squarely in the NGSS science and engineering practices in the doing of science. Students are also “doing language” by asking questions, planning investigations, developing models, constructing explanations, and engaging in argumentation. The equitable engagement in these practices supports the fundamental goal and principles of the CA ELD standards using language in meaningful and relevant ways.

Sunday, October 18
10:30am - 12:00pm

Sunday, October 18 • 10:30am - 12:00pm

**Building Literacy through Science with the Five Es**

Kenn Heydrick, EdD, STEMscopes/Accelerate Learning

Anthony Aranico, STEMscopes CA-NGSS Accelerate Learning

Nick Martin, STEMscopes CA-NGSS Accelerate Learning

Stephanie Shield, STEMscopes CA-NGSS Accelerate Learning

Using talking, reading, and writing skills can be an important foundation for teaching literacy. Through these activities, teachers can increase rigor in their classroom and promote a more student-centered environment, whether meeting students face to face or in a virtual platform. Participants will use a variety of tech tools that can easily be used with students in a distance learning environment.

Science: Chemistry, Earth/Space Science, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics

Grade Level: TK-12

Emphasis(es): Disciplinary Core Ideas (DCIs), Pedagogy, Science & Engineering Practices (SEPs)

**Adapting PEAK E-STEAM Lessons to Address Equity in Your Classroom!**

Tinuviel Carlson, The Energy Coalition

Mallory Schaefer, The Energy Coalition

Megan Hollyfield, The Energy Coalition

Are your students empowered to take ownership of their STEAM learning? Adapt PEAK curriculum, NGSS aligned, and EP&C inclusive lessons into a hands-on student-centered experience by engaging your “inner child” through empathy to frame equity.

Science: Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Physical Science

Grade Level: TK-8

**Sunday, October 18 • 10:30am - 12:00pm**

**Build Better Balloon Cars! (By Applying Newton’s Laws of Motion)**
Justin Fournier, Anaheim Union High School
Amanda White, California State University Long Beach

We can all recite Newton’s laws of motion, but what do they really mean? We’ll provide high-and-low-tech activities that help students gain a conceptual understanding of Newton’s Laws that model NGSS’s three dimensions using an exciting engineering challenge!

- **Science:** Engineering, Physical Science, Physics
- **Grade Level:** 6-12
- **Emphasis(es):** Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

**Crosscutting Concepts for Equity and Rigor**
Annika Goodin, Grossmont Union High School District
Todd Linke, Mount Miguel High School

Come find out how the CCCs can bolster both equity and rigor in the science classroom. We’ll look at some resources, templates, and activities to get all students thinking at deeper DOK levels and using academic language with the CCCs.

- **Science:** Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
- **Grade Level:** 3-12
- **Emphasis(es):** Crosscutting Concepts (CCCs), Pedagogy, Science & Engineering Practices (SEPs)

**Extreme Makeover: Science Activity Edition**
Francis Ogata, Amplify
Lauren Loney, Amplify

Are the egg drop and pea pod activities still a part of your middle school classroom? If so, it’s time for a science activity makeover. Join us and experience new and improved versions of both of these favorite activities.

- **Science:** Engineering, Life Science/Biology, Physics
- **Grade Level:** 6-8
- **Emphasis(es):** Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

**How Students Benefit from Phenomena and Notebooks in NGSS Instruction**
Burr Tyler, WestEd
Jean Brlectic, Kings Canyon Unified School District

Early Implementer teachers have reported that students greatly benefit from NGSS instruction. We will discuss how three types of benefits for students are being achieved through NGSS instruction: (1) higher student engagement, (2) more inclusive engagement, and (3) higher-level learning.

- **Science:** Physical Science
- **Grade Level:** TK-8
- **Emphasis(es):** English Learner/English Language Development, Pedagogy

**Implementing NGSS Professional Learning Designed for Administrators**
Sharon Matsuzaki, Kings Canyon Unified School District
Bradley Schleder, Kings Canyon Unified School District

Administrator support is essential for successful NGSS implementation. Our session outlines two years of systemic NGSS administrator professional learning. The session includes tools for data driven decision making and processes for continuous improvement of NGSS implementation.

- **Science:** Physical Science
- **Grade Level:** TK-8
- **Emphasis(es):** Leadership (Coaching, Site Leadership, Administrator, Professional Development), TOSA/Science Coach

**Integrating Environmental Literacy into TK-5 5E Project-based Investigations**
Robyn Stone, Synopsys Silicon Valley Science & Technology Outreach Foundation

Discover ways to integrate environmental literacy into TK-5 5E project-based investigations aligned to EP&Cs and NGSS starting with real-world phenomena or local environmental problems which lead to project-based solutions or community-based advocacy work.

- **Science:** Climate, Environmental Science, Integrated Science (Bundled Across Domains)
- **Grade Level:** TK-5
- **Emphasis(es):** Climate, EP&Cs/Environmental Literacy, Science & Engineering Practices (SEPs)

**KLEWS...Now What?: Supporting Student Developed Explanations in Science**
Channon Jackson, Alameda County Office of Education
Dawn O’Connor, Alameda County Office of Education

Do your students struggle to create explanations? In this session you will engage in a series of activities designed to provide equitable access to all students through various strategies as they construct explanations that develop their evidence and reasoning.

- **Science:** Life Science/Biology
- **Grade Level:** TK-5
- **Emphasis(es):** Classroom Management/Engagement, English Learner/English Language Development, Pedagogy
SUNDAY

Night-Owl or Morning-Lark? The Answer May Be in Your Genes
Bruce Bryan, miniPCR bio
The miniPCR Sleep Lab links the genetic control of circadian rhythms to students’ own DNA. Use PCR and DNA gel electrophoresis to determine your own circadian genotype. Students explore a genetic association in this authentic research investigation.
Science: Life Science/Biology
Grade Level: 9-12
Emphasis(es): STEM/STEAM/Maker, Technology Integration

Nurturing Environmental Literacy Through Partnerships and Action
Mary Walls, Environmental Education Collaborative
Pamela Johnson, Emerald Cove Outdoor Science Institute
Explore ways that learners can engage with local phenomena with the support of nonformal partners and community members. The focus will be looking at how resources are shared in the Inland Area of Southern California.
Science: Climate, Earth/Space Science, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology
Grade Level: TK-12

Plate Tectonic’s Driving Force - NGSS activities from the Exploratorium
Eric Muller, The Exploratorium
Gather evidence to make a model of how the cooling of the earth’s interior is driving its exterior plate motion. Join us and be part of the upper crust as we investigate the driving force of plate tectonics.
Science: Earth/Space Science, Environmental Science, Integrated Science (Bundled Across Domains), Physical Science
Grade Level: 6-12
Emphasis(es): Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), EP&Cs/Environmental Literacy

Preparedness Ambassadors, Disaster Preparedness for California’s Fourth Graders
Jonathan Rhodea, Sacramento County Office of Education
Phil Romig, Sacramento County Office of Education
This workshop combines science and health standards with the Environmental Principles and Concepts. Participants will engage in self-selected localized phenomena (earthquake fire, etc.) and learn how students can prepare their homes, school, and community in an emergency.
Science: Earth/Space Science, Environmental Science, Integrated Science (Bundled Across Domains)
Grade Level: 4

Schoolyard Environmental Action Projects
Beth Callaghan, Monterey Bay Aquarium
Learn about the Monterey Bay Aquarium’s Project-Based Science framework. Our work to inspire conservation of the ocean starts when we empower student agency and develop a sense of place through local environmental action projects.
Science: Environmental Science, Life Science/Biology
Grade Level: 3-8

Taking Science Outside: Rich and Rewarding Approaches for NGSS
Emilie Lygren, Lawrence Hall of Science
Schoolyards can be ideal settings for engaging, phenomenon-driven lessons that build students’ environmental literacy and scientific sensemaking skills. We’ll model an activity, make connections to the NGSS and inclusive teaching practices, and share strategies for supporting effective outdoor learning.
Science: Environmental Science, Life Science/Biology
Grade Level: 3-8

Teach Authentic Engineering Using the Educator-Friendly DIVE Method
Lloyd Martinez, Ventura County
Kris Herman, 3D Molecular Designs
The easy-to-implement DIVE Method (Deconstruct, Imitate, Vary, Explore) engages students in analyzing existing technologies and then innovating upon them, like professional engineers. Try it out in this fun, hands-on, make-and-take session. Great for NGSS engineering, makerspaces, and afterschool programs!
Science: Engineering
Grade Level: 3-12
Emphasis(es): Pedagogy, Science & Engineering Practices (SEPs), STEM/STEAM/Maker

Using Models to Make Connections Between DNA and Chromosomes
Chris Chou, 3D Molecular Designs
In this hands-on interactive workshop, participants will learn how to utilize physical chromosome and DNA models to explore and compare the processes of mitosis and meiosis with students.
Science: Life Science/Biology
Grade Level: 6-12

Why don’t I have any tomatillos? SEP8 and a Phenomenon
Frederick Peinado Nelson, California State University, Fresno
Participants will investigate the phenomenon of a tomatillo plant that has flowers but no fruit using a variety of information sources, such as articles, images, video, and hands-on interactions. SEP8 is explicitly used to consider multiple text types.
Science: Environmental Science, Life Science/Biology
Grade Level: 3-5
Emphasis(es): Common Core-Literacy, Science & Engineering Practices (SEPs)
SUNDAY

Sunday, October 18 • 10:30am - 12:00pm
Write On: Moving From Stagnant Worksheets to Engaging Interactive Notebooks!
Eeva Burns, Carolina Biological Supply Company
Learn how note-booking provides students opportunities to think and act as scientists. Strategies and examples such as guided student observations, focus questions, scaffolds and diagrams will be highlighted by focusing on the NGSS SEP “obtaining, evaluating, and communicating information.”
Science: Engineering, Physical Science
Grade Level: TK-5
Emphasis(es): Assessment, Pedagogy, Science & Engineering Practices (SEPs)

FOCUS SPEAKER

#NoInvisibles
Stephen Pruitt, Southern Regional Education Board
Each day in the classrooms and schools across the state and the country, there are students who do not feel they are part of the system. They are “invisible.” In this presentation, Dr. Pruitt will discuss how we can ensure these students are “seen” in our science classrooms and subsequently set up to be successful members of the economy and allow them to pursue their version of the American Dream.
Sunday, October 18
12:30pm - 2:00pm

Sunday, October 18 • 12:30pm - 2:00pm
Understanding Global Change: Community Designed Tools Exploring the Earth System
Jessica Bean
Henriette Hewett
Janet Lee, Gilroy Unified School District
Devin Jackson, Mt. Diablo Unified School District
Sarah Machado, Summit Learning
Vanessa Brunsing, Twin Hills Union School District
The Understanding Global Change Project at UC Berkeley and classroom educators co-developed online and interactive learning materials that allow students to construct models that explain the Earth as an interconnected, dynamic system. Come explore the Earth system with us!
Science: Chemistry, Climate, Earth/Space Science, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: 6-12

CASE’S MONTHLY E-NEWSLETTER

Sign-up as a member to receive California Classroom Science Today!
Join Our Community
cascience.org | classroomscience.org
SUNDAY

Sunday, October 18 • 12:30pm - 2:00pm

3D NGSS Early Implementers: Water Cycling and Distribution- CS Integrated
Jeff Schmitz, Vista Unified School District
Jenny Chien, Vista Unified School District
Water is everywhere! Learn about the journey a water molecule takes through NGSS experiences and Computer Science enhancements. Participants will engage in a 5E lesson investigation, learn how to develop an animated model, and construct an explanation of model limitations.

Science: Climate, Earth/Space Science, Environmental Science
Grade Level: 5-6

Building Models in NGSS with Microsoft Office and Google Drive
Lyle Tavernier, NASA/Jet Propulsion Laboratory
Modeling is part of NGSS Crosscutting Concepts, Scientific and Engineering Practices and Disciplinary Core Ideas. Learn how students can use programs in Microsoft Office and Google Drive to build and manipulate Earth science and Astronomical models.

Science: Earth/Space Science
Grade Level: 3-12
Emphasis(es): Beef Up on Content, Science & Engineering Practices (SEPs), Technology Integration

Conserving Panda Populations through Understanding their Reproductive Endocrinology
Damon Tighe, Bio-Rad Laboratories
Taylor Page, Bio-Rad Laboratories
Can your students save Giant Pandas? Explore topics such as homeostatic regulation and the effect of reproductive hormones, immunological responses and ecosystem balance all at once as they engineer a hormone detection system that can be utilized for Panda conservation.

Science: Environmental Science, Life Science/Biology
Grade Level: 9-12
Emphasis(es): Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

Curiosity and Discussion Tools for Students Outdoors (and in!)
Kevin Beals, BEETLES, Lawrence Hall of Science
We’ll learn and use simple transformative research-based and widely-tested critical thinking tools that inspire students to directly engage with nature and with each other anywhere using science practices. We’ll also dive deep into the pedagogy behind them.

Science: Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology
Grade Level: 3-8

Christy Sanders, TCI
Nathan Wellborne, TCI
Participants will be immersed in an investigation designed to reach all learners and make learning science concepts fun and engaging. They will make different kinds of waves with different materials and come up with a scientific definition of waves.

Science: Engineering, Integrated Science (Bundled Across Domains), Physical Science
Grade Level: 6-8
Emphasis(es): Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

Embedding Earth Science & EPCs into Physics Through PBL
Joshua Gagnier, SAUSD
Come see how Santa Ana Unified School District and ASPIRE collaborated with NASA/JPL to integrate Environmental Science, EP&C, and Engineering into their high school Physics courses. Leave with all of the developed resources for this full Project-Based Learning Unit!

Science: Earth/Space Science, Environmental Science, Physics
Grade Level: 6-12
Emphasis(es): Disciplinary Core Ideas (DCIs), EP&Cs/Environmental Literacy, Technology Integration

Evidence of Student Learning: 3-D Assessment From Start to Finish
Evea Burns, Carolina Biological Supply Company
What does assessment look like in the 3-D classroom? Experience Pre-Assessments, Formative Assessments, and Summative Assessments in multiple formats for a K-5 science classroom. Learn how 3 dimensional learning goes hand and hand with 3 dimensional assessments.

Science: Engineering, Physical Science
Grade Level: TK-5
Emphasis(es): Assessment, Crosscutting Concepts (CCCs), Science & Engineering Practices (SEPs)

Family Science Night: Pro Strategies and Tips
Kristin Majda, STEMscopes CA-NGSS
Accelerate Learning
Family STEM events can help stimulate curiosity and support NGSS implementation. Learn tried and true strategies for establishing your own Family Science Night Program from a few veterans who have been leading STEM enrichment events for years. Whether you want a plug-and-play solution or you want to build your own program from the ground up, we’ll show you how! Free resources and a raffle for fun prizes!

Science: Integrated Science (Bundled Across Domains)
Grade Level: TK-8
Emphasis(es): Informal Science Education, STEM/STEAM/Maker

Good Vibrations: The Science of Sound and Music
Victor Minces, UCSD, in collaboration with Chris Olivas at High Tech Middle North County
Join neuroscientist and cognitive researcher Victor Minces as he walks through free online tools designed for exploring and creating sound. Participants will experience one of ten lessons in this NGSS aligned learning sequence also adapted for distance learning.

To play with the online tools, and make sure they work on your computer, visit: www.listeningtowaves.com/sound-exploration.

Science: Engineering, Integrated Science (Bundled Across Domains), Physical Science, Physics
Grade Level: 6-12
Emphasis(es): Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), Technology Integration

Assessments, and Summative Assessments in multiple formats for a K-5 science classroom. Learn how 3 dimensional learning goes hand and hand with 3 dimensional assessments.

Science: Engineering, Physical Science
Grade Level: TK-5
Emphasis(es): Assessment, Crosscutting Concepts (CCCs), Science & Engineering Practices (SEPs)

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Science: Integrated Science (Bundled Across Domains)
Grade Level: TK-8
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Science: Engineering, Integrated Science (Bundled Across Domains), Physical Science, Physics
Grade Level: 6-12
Emphasis(es): Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), Technology Integration
**Let's Talk Grading!**

*Carissa Williams, Tustin Unified / CSUF*

Come join a conversation around equity and grading! Learn how to create and use 4-point and single-point rubrics to assess three dimensional learning. Let’s share ideas as we all figure out how to create equitable NGSS assessment systems together!

**Science:** Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics  
**Grade Level:** TK-12  
**Emphasis(es):** Assessment, Pedagogy

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**Navigating Race and Implicit Bias in the Science Classroom**

*Leena Bakshi, STEM 4 Real  
Rosanna Ayers, Merced County Office of Education*

Analyze current systems of inequity in schools, reflect on implicit bias and microaggressions that affect student outcomes and learn key instructional strategies for every student, including our most vulnerable student populations. Leave with an example of a culturally responsive lesson!

**Science:** Environmental Science, Integrated Science (Bundled Across Domains)  
**Grade Level:** TK-12  
**Emphasis(es):** Leadership (Coaching, Site Leadership, Administrator, Professional Development), Pedagogy, TOSA/Science Coach

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**Nurture Science Literacy and Foster Critical Thinking with Claim-Evidence-Reasoning (CER)**

*Kassie Mendes, Accelerate Learning  
Kerrn Heydrick, EdD, STEMscopes/Accelerate Learning  
Michelle Cozza, STEMscopes CA-NGSS Accelerate Learning*

Claim-Evidence-Reasoning (CER) provides a framework to support students in constructing and evaluating scientific phenomena, explanations, and arguments. Learn how to implement this effective strategy and scaffold support to nurture science literacy and foster critical thinking throughout grades K-12.

**Science:** Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics  
**Grade Level:** TK-12  
**Emphasis(es):** Assessment, Pedagogy, Science & Engineering Practices (SEPs)

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**Science and Literacy: A Win-Win**

*Michele Roy, Kern County Office of Education  
Jamie Viveros, Kern County Superintendent of Schools*

It’s widely recognized that the convergence of science and ELA results in increased student engagement, learning, and teacher efficacy. Come experience an NGSS-aligned learning sequence through the lens of literacy. Be ready to consider planning science instruction with a focus on literacy.

**Science:** Physical Science  
**Grade Level:** 3-5  
**Emphasis(es):** Common Core-Literacy, Pedagogy, TOSA/Science Coach

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**Snails and their Environment: Helping Young Students Analyze Data**

*Kelsey Lipsitz, The Exploratorium*

Join the Exploratorium’s Institute for Inquiry to see how to support young students engage in the practice of Analyzing and Interpreting Data to make sense of phenomenon. We will observe snails and share our experiences from the classroom!

**Science:** Earth/Space Science, Environmental Science, Life Science/Biology  
**Grade Level:** TK-5  
**Emphasis(es):** Crosscutting Concepts (CCCs), Leadership (Coaching, Site Leadership, Administrator, Professional Development), Science & Engineering Practices (SEPs)

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**The One Kit Wonder: Using Models to Teach Biotechnology Concepts**

*Diane Sigalas, 3D Molecular Designs  
Kris Herman, 3D Molecular Designs*

Discover how hands-on modeling can engage students when teaching PCR, Sanger Sequencing, and Restriction Enzymes. Explore how these activities enrich in-class and distance learning. Through these lessons, your students can experience the process, not just memorize results.

**Science:** Life Science/Biology  
**Grade Level:** 9-12  
**Emphasis(es):** Beef Up on Content, Crosscutting Concepts (CCCs), Pedagogy

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**Using Science Instruction to Build a Community of Learners**

*Amelia Rosenman, California Academy of Sciences  
Sara Dunn, San Francisco USD  
Gina Maschio, San Francisco USD*

Students who feel connected to their classmates and teachers do better socially, emotionally, and academically. Learn how to use science instruction to build a community of learners, where all students know they and their ideas are valuable.

**Science:** Integrated Science (Bundled Across Domains)  
**Grade Level:** TK-5  
**Emphasis(es):** Classroom Management/Engagement, Pedagogy, TOSA/Science Coach
ON DEMAND

The Future of Teaching: Blending Online and On-site Instruction
Stephanie Shield, STEMscopes CA-NGSS Accelerate Learning
Megan Sulzberger, CSU Monterey Bay
Kristin Majda, STEMscopes CA-NGSS Accelerate Learning

This webinar will help teachers prepare for the ambiguity of fall 2020 and the possibility of serving students both on-site and online. We will share practical strategies, like setting up a tech-friendly classroom, creating flexible lesson plans, and using collaboration protocols to support student learning regardless of location. In addition to supporting a blended learning environment, these strategies can also be used to support absent students, those on independent study, and teachers wanting to provide additional differentiation and opportunities through technology.

Engineering an Appendage Transport Container: Thermochemistry with a Health Emphasis
Savannah Addy, Grossmont Union High School District
Rosanna Lupien, Grossmont Union High School District

A complete thermochemistry unit will be presented within the context of Community Health. The premise of the unit is that students will design an insulated calorimeter along with a cold pack to keep a mock severed appendage cold in transport.

Science: Chemistry
Grade Level: 10-12

Promoting Changes to Student Understanding of Phenomena with Summary Boards
Rachel Meisner, Sweetwater Union High School District
Ksenia Pavlova, Sweetwater Union High School District

Participants will learn how to revisit phenomena throughout a unit to deepen students understanding. Through a hands-on experience they will visualize how to start a lesson and use the activity summary board. Chemistry and Physics Lesson examples will be provided.

Science: Chemistry, Physics
Grade Level: 10-12

Phenomenon + Discourse: An Engaging and Welcoming Approach to NGSS
Nathan Fairchild, Shasta County Office of Education
Mark Lewin, Enterprise Elementary School District

Play with phenomenon and discourse in a hands-on/minds-on way. Our grant work led to the realization that these two aspects of NGSS lead to a fascination with all three dimensions (plus some ELA!). Our most popular PD among elementary teachers.

Science: Life Science/Biology
Grade Level: 1-12
Emphasis(es): Informal Science Education, Leadership (Coaching, Site Leadership, Administrator, Professional Development), Pedagogy

A K-5 Teacher's Guide to Sketchnoting
Lesley Gates, Fresno County Superintendent of Schools

Sketchnoting is an important skill for K-5 students as it helps them process new material, develop skills to articulate their thinking, and build connections to larger concepts in all content areas. Come learn how to incorporate sketchnoting in your classroom!

Science: Earth/Space Science, Environmental Science, Life Science/Biology, Physical Science
Grade Level: 1-6
Emphasis(es): English Learner/English Language Development, Pedagogy, Science & Engineering Practices (SEPs)

More Than a Science Fair! Build Your Student Media Festival
Hall Davidson, Discovery Education


Science: Chemistry, Climate, Earth/Space Science, Environmental Science, Life Science/Biology, Physical Science, Physics
Grade Level: 2-12
Emphasis(es): Assessment, Crosscutting Concepts (CCCs), Technology Integration

The Science Behind SEL: Classroom and Community SEL Resources
Hall Davidson, Discovery Education

There is science behind social emotional learning. Learn the science while learning about free SEL resources for grades 2-12, include video field trips, online simulations, evidence-based student ‘exercises’ that foster well-being. Lesson plans and more in these free classroom programs.

Science: Integrated Science (Bundled Across Domains)
Grade Level: 2-12
Emphasis(es): Pedagogy, Technology Integration

Science: The "Write" Inspiration for Academic Language and Writing Genres
Dr. Shannon Dadlez, Riverside Unified School District

Science engages students, inspiring participation in critical discussions and promoting inspiration. Learn to lead students into writing by guiding discussions about hands-on activities using academic language tools and scaffolds for argumentative, informative, and narrative writing.

Science: Integrated Science (Bundled Across Domains)
Grade Level: 2-5
Emphasis(es): Classroom Management/Engagement, Common Core-Literacy, English Learner/English Language Development

Adolescent Award Brain - Classroom Management for Challenging Science Classrooms
Julie Smith, Lennox SD

Have students that are snarky and unmotivated? Find new ways to do positive behaviour management, even if you have really challenging, difficult students. This session is interactive, so come prepared to share and discuss best practices.

Science: Earth/Space Science, Engineering, Integrated Science (Bundled Across Domains)
Grade Level: 3-12

Brown Bag Innovation
Julie Medina, Fleet Science Center

This interactive session, attendees will practice innovation, teamwork and empathy as they try create designs with unknown materials under specific constraints. By making science accessible and relevant, participants will explore the engineering design process and present their creations.

Science: Engineering
Grade Level: 3-12
ON DEMAND

Building VR Worlds: Crayons to Pirates to Life Cycles!
Hall Davidson, Discovery Education
See how crayon drawings convert into Virtual Reality (VR) worlds. Explore building VR to explain chemical cycles, life cycles, etc. Build class VRs, too, with free tour creators, mobile phones, tablets. How to do it--then view it!
Science: Chemistry, Climate, Engineering, Integrated Science (Bundled Across Domains), Life Science/Biology, Physics
Grade Level: 3-12
Emphasis(es): Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), Technology Integration

Discover Phenomena and Other Resources in National Parks
Mary Calvaresi, National Park Service
Monique Navarro, National Park Service
Adali Olivares, National Park Service
Alison Shoup, National Park Service
National Parks are ideal places to discover compelling phenomenon and explore it through NGSS-driven instruction. Discover investigations that can spark later curiosity about more local concerns. Learn ways to use natural phenomena in National Parks to drive your NGSS instruction.
Science: Environmental Science
Grade Level: 3-12
Emphasis(es): Beef Up on Content, Disciplinary Core Ideas (DCIs), Informal Science Education

Distance learning for science? How do I do that?
Jonathan Foster, Dixon Unified School District
Did you have to completely change your teaching style last year? Me too! Participants will be introduced to a variety of ways they can provide meaningful science instruction through online learning platforms that are both fun and engaging.
Science: Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: 3-12
Emphasis(es): Computer Science in Science, Science & Engineering Practices (SEPs), Technology Integration

Explore Mars with NASA’s Perseverance Mars rover in the Classroom!
Lyle Tavernier, NASA/Jet Propulsion Laboratory
Launched in the summer, NASA’s Perseverance rover will land on Mars on February 18, 2021. NASA’s Jet Propulsion Laboratory provides NGSS and CC Math aligned STEM lessons to bring the excitement of Mars exploration into K-12 classrooms.
Science: Earth/Space Science, Engineering, Physical Science
Grade Level: 3-12
Emphasis(es): Beef Up on Content, Science & Engineering Practices (SEPs), STEM/STEAM/Maker Integration

Exploring Visual Programming with Scratch on Mars
Lyle Tavernier, NASA/Jet Propulsion Laboratory
In this workshop, attendees will learn how students can program a Mars rover game while learning about Martian geology. Bring your laptop and get hands on practice developing a game to land a rover, drive, and collect science targets!
Science: Earth/Space Science, Engineering
Grade Level: 3-12
Emphasis(es): Beef Up on Content, Computer Science, Technology Integration

Layered Curriculum: Pairing Differentiated Instruction with Student Responsibility
Craig Whitmore, Norris Middle School
Layered Curriculum is an extremely flexible method for differentiating instruction that helps engage both lower and higher performing students. Every teacher should have this in their “tool chest”. Attendees receive innovative assignment examples and create their own Layered Curriculum.
Science: Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: 3-12
Emphasis(es): Classroom Management, Engagement, Pedagogy, Preservice Teacher Education/TPAs

Teach Science through Technology
Sitara Ali, Turlock Unified School District
Learn how FlipGrid, Digital Breakouts through Google Forms, Adobe Spark, and ScreenCastify can help increase the critical thinking along with pushing creatively, communication, and collaboration to seamlessly integrate technology into the classroom and redefine learning.
Science: Chemistry, Climate, Earth/Space Science, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: 3-12
Emphasis(es): Technology Integration

Ramp it Up! Science and Engineering Practices in the NGSS
Kelsey Moore, TCI
Nathan Wellborne, TCI
Participate in an engaging Bring Science Alive! investigation that has your elementary students developing solutions and making sense of the natural and designed world. Participants will design and build a ramp to understand how energy and motion are related.
Science: Physical Science
Grade Level: 3-5
Emphasis(es): Classroom Management, Engagement, Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

CSforAll: Building Intellelctual Capacity through Computer Science
Omar Shepherd, Orange County Department of Education
The California Computer Science Standards aren’t just another thing. In fact the intentional development of the standards provide a great opportunity for integration across content areas from ELA; CCSS-M, to NGSS!
Science: Engineering, Physical Science
Grade Level: 3-8
Emphasis(es): Computer Science in Science, Crosscutting Concepts (CCCs), Science & Engineering Practices (SEPs)

If Elephants Could Teach: New Approaches to Your Sound Unit
Patricia Newman, Patricia Newman Books
Shake up your sound unit with elephants! They communicate within and below our range of hearing, and are great at helping us teach the physics of sound.
Science: Environmental Science, Physical Science, Physics
Grade Level: 3-8
Emphasis(es): Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

Let’s Create a Makerspace: It’s easier than you think!
Naomi Hartl, School Specialty Frey
Picture a space inside your school where students can create, invent, build, tinker and make. Join this workshop to find out how to create a dedicated room, or a corner in your classroom or library, regardless of your budget!
Science: Engineering
Grade Level: 3-8
Emphasis(es): STEM/STEAM/Maker Integration
ON DEMAND

Revitalizing Science Education by Bringing Kids and Families Outdoors

Devin Jackson, Outside The Box 925
Tascha Barnes, Outside The Box 925
Participants will experience venturing both outdoors and outside traditional science lessons by enriching their NGSS aligned units with vetted science, technology and engineering activities to include the California standards focusing on the Environment.
Science: Climate, Earth/Space Science, Environmental Science
Grade Level: 3-8
Emphasis(es): Climate, EP&Cs/Environmental Literacy, STEM/STEAM/Maker

High Altitude Student Space Experiments

Christine Hirst Bernhardt, University of California, Santa Barbara
Transfer the reins of learning and empower students to design and test their own investigations in the space environment aboard high altitude balloons. This transformative experience will forever alter you as a learner and leader. The stratosphere is the limit!
Science: Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Physical Science, Physics
Grade Level: 5-12
Emphasis(es): Climate, Crosscutting Concepts (CCCs), Science & Engineering Practices (SEPs)

Astronomy is out of this World!

Christine Hirst, West Ranch High School
Daniel Bernhardt, LAUSD
Astronomy provides rich, relevant learning to connect space to real world phenomena. Come learn how to incorporate space-based data literacy to support evidence based learning and problem solving skills in every science class!
Science: Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: 6-12
Emphasis(es): Beef Up on Content, Crosscutting Concepts (CCCs), Science & Engineering Practices (SEPs)

Climate Change, Ocean Food Webs and Oxygen Minimum Zones

Beth Callaghan, Monterey Bay Aquarium
Use an ocean food web lens and current data to help understand how climate change may affect individual organisms, species and food webs in extreme environments.
Science: Climate, Environmental Science, Life Science/Biology
Grade Level: 6-12
Emphasis(es): Climate, EP&Cs/Environmental Literacy

Giving Students a Reason to Argue from Evidence in Engineering

Lee Anne Gleim, Argument-Driven Inquiry
Victor Sampson, The University of Texas at Austin
This workshop features a secondary engineering design challenge that promotes three-dimensional STEM instruction aligned with NGSS. ADE, Argument-Driven Engineering, is an 8-stage instructional approach that includes authentic, student-centered design challenges and can be integrated into any STEM curriculum grades 6-8.
Science: Chemistry, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: 6-12
Emphasis(es): Beef Up on Content, Science & Engineering Practices (SEPs), STEM/STEAM/Maker

Introducing Earth Systems With Understanding Global Change Tools

Henriette Howett, De La Salle High School
Jessica Bean
Vanessa Bruning, Twin Hills Union School District
Devin Jackson, UGC UC Berkeley
Janet Lee, Gilroy Unified School District
Sarah Machado, Summit Learning
Participants will experience a lesson sequence using the Understanding Global Change Framework. Participants will construct models and identify connections between biotic vs. abiotic components of the Earth system that support student sensemaking and connect content across a unit of study.
Science: Climate, Earth/Space Science, Environmental Science
Grade Level: 6-12

Mindfulness for Social Emotional Development in the Classroom: Tools & Practices for Educators

Jenny Chambers, Capistrano Unified School District
Christy Curtis, Capistrano Unified School District
Experience scientifically based practices that support mindfulness. Understand the psychological and physiological effects of mindful practices. Learn how mindfulness reduces stress, rewire neural pathways for greater focus and concentration, and increases educator and student wellbeing.
Science: Integrated Science (Bundled Across Domains), Life Science/Biology
Grade Level: 6-12
Emphasis(es): Informal Science Education, Leadership (Coaching, Site Leadership, Administrator, Professional Development), Pedagogy

Sally Ride Was Gay? Supporting LGBTQ Students in the Classroom

Beverly Berekian, Anaheim Union High
Jose Sotoramos, Stem 4 Real
Over 10% of California’s middle and high school students identify as LGBTQ. In this session, we will investigate issues that are pertinent to our LGBTQ students and learn how to create a more inclusive environment in classrooms, schools and districts.
Science: Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: 6-12
Emphasis(es): Climate, Leadership (Coaching, Site Leadership, Administrator, Professional Development), Pedagogy
ON DEMAND

Using Understanding Global Change Framework to Center NGSS Aligned Unit
Devin Jackson, Understanding Global Change, UC Berkeley
Jessica Bean
Janet Lee, Gilroy Unified School District
Sarah Machado, Summit Learning
Vanessa Brunsing, Twin Hills Union School District

Participants will experience the Understanding Global Change (UGC) Sea Level Rise Unit, a coherent, three-dimensional sequence of lessons for high school and middle school science courses. This experience supports educators planning their own NGSS aligned units using the UGC Framework.

- Science: Climate, Earth/Space Science, Environmental Science, Integrated Science (Bundled Across Domains)
- Grade Level: 6-12

Designing Ocean Breakwaters
Betty Buehler, Lab-Aids
Mark Koker, Lab-Aids

What problems do waves cause for shoreline homeowners? In this workshop, you will use tools to model the effect of ocean waves on a cliff, by designing and testing breakwater structures to prevent beach erosion.

- Science: Earth/Space Science
- Grade Level: 6-8
- Emphasis(es): Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

Planning and Carrying Out Investigations in Middle School with ADI
Leeanne Glein, Argument-Driven Inquiry
Victor Sampson, The University of Texas at Austin

This workshop features an ADI lab example that promotes Three-Dimensional science instruction. ADI, or Argument-Driven Inquiry, is an 8-stage instructional approach where students plan and carry out their own investigations and can be integrated into any STEM curriculum Grades 3-12.

- Science: Earth/Space Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science
- Grade Level: 6-8
- Emphasis(es): Beef Up on Content, Common Core-Literacy, Science & Engineering Practices (SEPs)

You Can Call Me Al! Integrating Algorithms/Coding into Your Content
Mark Wakita, Red Hill Lutheran School

Algorithmic design and coding address the top three skills in the 2020 World Economic Forum Future of Jobs Skills List. This workshop shows you how to integrate algorithmic design and coding with your content to improve and deepen understanding.

- Science: Chemistry, Climate, Earth/Space Science, Engineering, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science
- Grade Level: 6-8
- Emphasis(es): Computer Science in Science, Crosscutting Concepts (CCCs), Pedagogy

Experience Kinematics: Using Multiple Representations to Understand “Sailing Stones”
Chris Moore, University of Nebraska Omaha

Experience Physics takes a “radical” approach to teaching kinematics by building understanding through multiple representations instead of blindly “using” equations. Learn how to combine California NGSS and Common Core Math to construct understanding, using real data about “sailing stones.”

- Science: Physics
- Grade Level: 9-12
- Emphasis(es): Common Core-Math, Disciplinary Core Ideas (DCIs), Science & Engineering Practices (SEPs)

Creating the Ultimate K-2 Science Lesson
Patty Low, ExploreLearning

A K-2 classroom is already a labyrinth of twists and turns. Science shouldn’t make you feel like you are spinning out of control! Explore K-3 multi-sensory/hands-on activities to help students make connections and deepen their understanding of science concepts.

- Science: Physical Science
- Grade Level: TK-12
- Emphasis(es): Common Core-Literacy, Disciplinary Core Ideas (DCIs), STEM/STEAM/Maker

You Too Can Implement Phenomena Driven ESS Embedded Chemistry Curriculum
Rachel Meisner, Sweetwater Union High School District

Participants will walk away from this workshop with an understanding of how I structure my chemistry course to incorporate earth science. In particular, I will highlight phenomena for each unit including hands-on practice of activities related to Ocean Acidification.

- Science: Chemistry, Climate, Earth/Space Science, Environmental Science
- Grade Level: 9-12
- Emphasis(es): Beef Up on Content, Climate, Pedagogy

Early Implementer Strategies for Districtwide NGSS Implementation
Bun Tyler, WestEd
Brad Schleder, Kings Canyon Unified School District
Zoe Randall, San Diego Unified School District
Dave Tupper, Lakeside Unified School District

In the CA K-8 NGSS Early Implementers Initiative, eight districts have been working for six years to achieve districtwide NGSS implementation. We’ll share a variety of strategies they’re using to spread NGSS understanding and practice to all teachers.

- Science: Integrated Science (Bundled Across Domains)
- Grade Level: TK-12
- Emphasis(es): Leadership (Coaching, Site Leadership, Administrator, Professional Development), TOSA/Science Coach
Harness the Sun: Photovoltaic-Solar Cell Challenge
Robert Corbin, Discovery Education, Inc.
Using inexpensive miniature motors, solar panels, and propellers, participants determine optimum angle of incoming solar insolation to create operating solar windmills or cars. Along the way, participants discover properties, limitations/ constraints of solar panels and fundamentals of electrical circuits.

Science: Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Physical Science, Physics
Grade Level: TK-12

NASA Program Update: Earth, Mars, the Universe and Astronauts
David Seidel, NASA/Jet Propulsion Laboratory
NASA has ambitious missions underway and plans to return samples from Mars, launch astronauts on commercial spacecraft and then on to the Moon and Mars, and much more. See what’s happening and how to follow the adventure in the classroom.

Science: Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains)
Grade Level: TK-12
Emphasis(es): Beef Up on Content, Climate

Supporting Students as Meaning Makers: Connecting Literacy and the NGSS
Meghan White, High Tech High
Supporting Students as Meaning Makers: Connecting Literacy and the NGSS will show you methods on how to spark inquiry through images, graphs, and non-fiction text to equitably engage your students on any topic.

Science: Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: TK-12
Emphasis(es): Common Core-Literacy, English Learner/English Language Development, Science & Engineering Practices (SEPs)

CHEETAHS, MONKEYS, OH MY! BECOMING ANIMAL REPORTERS.
Christopher Borjas, Santa Rosa Academy, Twig Science
During this workshop participants will learn more about how I have used Twig Science in my classroom to help my students become Animal Reporters!

Science: Life Science/Biology
Grade Level: TK-2
Emphasis(es): Science & Engineering Practices (SEPs), STEM/STEAM/Maker

STEAM Grant Writing 101
Jennifer Janzen, Santa Clara Unified School District

Answers to the all important question: How am I going to pay for that? Learn about the procedures and processes necessary for STEAM grant writing! Explore possible funding sources and how to submit both private and federal grant applications.

Science: Chemistry, Climate, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: TK-2, 3-5, 6-8, 9-12
Emphasis(es): Leadership (Coaching, Site Leadership, Administrator, Professional Development), Pedagogy, STEM/STEAM/Maker

Can You Make Giraffes Dance? Connecting K-5 Literature
Christie Pearce, Orange County Department Education
Lesley Gates, Fresno County Superintendent of Schools
Have a favorite book you wish you could share meaningfully? In this session you will learn how to think outside the box by incorporating fiction to enhance 5E science lessons. Participants will leave with a curated K-5 book list!

Science: Earth/Space Science, Engineering, Life Science/Biology, Physical Science
Grade Level: TK-5
Emphasis(es): Common Core-Literacy, Pedagogy

High Engagement, Low Cost, Low Stress, Engineering Lessons for K-5
Jamie Goebel, Murrieta
Adriana Toon, Murrieta
This high engagement workshop will give you a new perspective on how to bring engineering design into your K-5 classroom. These NGSS lessons include hands on engineering and design elements to help solve a relevant and applicable real world problem.

Science: Earth/Space Science, Engineering
Grade Level: TK-5
Emphasis(es): Classroom Management/Engagement, Crosscutting Concepts (CCCs), Science & Engineering Practices (SEPs)

Michelle Lourenco, Glen City Elementary
Kristin Majda, STEMscopes CA-NGSS Accelerate Learning
Participate in a fun, hands-on 5E lesson sequence scaffolded around SEP-2: Developing and Using Models. Then learn the strategies we used to design storylines around target SEPs in order to create model K-5 NGSS lesson sequences for our teachers.

Science: Integrated Science (Bundled Across Domains)
Grade Level: TK-5
Emphasis(es): Assessment, Pedagogy, Science & Engineering Practices (SEPs)

Beyond right and wrong: Formative assessment in Amplify Science
Rebecca Abbott, The Learning Design Group at UC Berkeley’s Lawrence Hall of Science
Leslie Stenger, The Lawrence Hall of Science
Take a deep dive into the resources in the Amplify Science assessment system and experience how to leverage the program’s embedded formative assessments to gain insight about student progress toward the unit’s learning goals, in all three dimensions.

Science: Earth/Space Science
Grade Level: TK-8
Emphasis(es): Assessment, Disciplinary Core Ideas (DCIs), Pedagogy

Building A Pre-Service Network in Your Community Using PLT
Cynthia Chavez, Project Learning Tree
PLT has a wide network of individuals working together to provide EE in formal and non-formal settings. You will learn to create your own pre-service group in your community to promote environmental education and stewardship.

Science: Climate, Environmental Science
Grade Level: TK-8
Emphasis(es): Climate, Preservice Teacher Education/TPAs, STEM/STEAM/Maker
Creating Stations Based Three Dimensional Lessons

Patti Duncan, Discovery Education
A great way to ensure that students are experiencing all three dimensions of science instruction is with stations. By varying the activities from station to station, students are exposed to content, connections, and practices that help paint the big picture.

Science: Physical Science
Grade Level: TK-8
Emphasis(es): Pedagogy, Science & Engineering Practices (SEPs), Technology Integration

Math & Science "Go Together"

Rosemary Garista, California Science Center
Marie de Krieger, California Science Center
Mariela Cerna-Lopez, California Science Center
You have heard math and science “go together,” but what does that look like? Learn how to leverage students’ schema to co-construct scientific thinking through cognitively guided instruction in math (CGI).

Science: Earth/Space Science, Engineering, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science
Grade Level: TK-8
Emphasis(es): Common Core-Math, Leadership (Coaching, Site Leadership, Administrator, Professional Development), Science & Engineering Practices (SEPs)

Stories & STEM: Modifying Activities to your Audience

Andia Pebdani, The Fleet Science Center
Turn literary page turners into opportunities for STEM problem solving! In this hands-on workshop we will explore how stories can be used as a tool for inquiry and provide context to STEM topics for various educator and student audiences.

Science: Chemistry, Earth/Space Science, Engineering, Environmental Science, Integrated Science (Bundled Across Domains), Life Science/Biology, Physical Science, Physics
Grade Level: TK-8
Emphasis(es): Beef Up on Content, Disciplinary Core Ideas (DCIs), Informal Science Education

Supporting student discourse in Amplify Science

Rebecca Abbott, The Learning Design Group at UC Berkeley’s Lawrence Hall of Science
Leslie Stenger, The Lawrence Hall of Science
What does it mean to talk like a scientist? Explore discourse routines and classroom discussion protocols that support students in engaging in authentic practices of science and engineering as they work to figure out a phenomenon.

Science: Earth/Space Science, Life Science/Biology
Grade Level: TK-8

3D Molecular Designs & MSOE Center for BioMolecular Modeling

Our hands-on/minds-on kits and models focus on core ideas and cross-cutting concepts in biology, chemistry, physical and life sciences. Teachers help develop and field test new products. Kits support STEM, NGSS, IB and PLTW.

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Amplify Education

Amplify Science California is a brand-new TK-8 curriculum built for the California NGSS. It also happens to be the most adopted science curriculum so far—out of 17 state-approved programs to choose from. We feel pretty honored to be the science curriculum partner of choice for so many districts. Developed with the Lawrence Hall of Science, our program fosters collaborative classrooms where science and engineering concepts are accessible to all teachers and students.

Chat with us here in our virtual booth and find out what makes this curriculum so phenomenal.

Erin King
55 Washington Street, 8th Floor
Brooklyn, NY 11201
(512) 673-8526
amplify.com

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Anatomology creates unique science gift items. All designs are original creations by the owner, Amy Sweetman.

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**California Association of Science Educators**
Join us in the CASE hub to connect and learn the latest about CA-NGSS in California, including assessment. Learn more about the member benefits.

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Folsom, CA 95630  
(916) 979-7004  
cascience.org

**California Project WET**  
(Water Education for Teachers)
California Project WET is a program of the Water Education Foundation - a non-profit organization dedicated to educating California citizens of all ages about water science and water issues.

Our professional development trainings maximize the time engaged in hands-on activities, allowing educators to experience Project WET activities as a learner and become familiar with the teacher designed features of the activities and guide. Every Project WET activity was created by teachers for teachers and each incorporates nationally recognized education principles and practices.

Project WET activities incorporate low cost materials and provide step-by-step instructions making the activities very popular with California educators of all levels of teaching experience. Project WET activities are correlated to Common Core Standards, California Education & the Environment Initiative (EEI) including detailed correlations and re-alignment connections to each dimension of the Next Generation Science Standards.

Project WET is at home in the classroom, in the field, a college methods course, as part of a water education outreach program - or in the home or ‘live’ online. Project WET activities are designed to easily integrate knowledge of local water resources - and our professional development workshops for educators can be tailored to highlight a variety of subjects related to water including: watersheds and other Earth systems; water conservation and quality; water in language arts and history; analyzing and interpreting water data and other science & engineering practices.

California Project WET also offers content-specific workshops ranging from one-day introductory climate change workshops with California Department of Water Resources Climate team members to multi-day trainings focused on California watersheds, the importance of floodplain ecosystems and water supplies with partners ranging from the US Geological Survey, California Water Science Center, Bureau of Reclamation, UC Cooperative Extension and California Society of American Foresters. California Project WET always seeks and welcomes new partners and host locations to help provide workshops throughout California.

Brian Brown  
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(916) 444-6240  
watereducation.org/project-wet

**California Water Service H2O Challenge**
The Cal Water H2O Challenge is a project-based, environmentally-focused competition for classrooms, grades 4-6. Brought to you in conjunction with DoGoodery, the WestEd K-12 Alliance, and Cal Water, and in partnership with the California Association of Science Educators, the Classroom Challenge is aligned with the Common Core State Standards and complementary to the Next Generation Science Standards and includes recommendations on how it can be integrated within your own classroom, while meeting curriculum goals. Through this integration, the Classroom Challenge offers a unique opportunity for upper elementary teachers to facilitate their students' learning of standards-based content, while developing the core understanding of environmental principles necessary to becoming science-literate citizens.

The Cal Water H2O Challenge, currently in its seventh year, began as a classroom competition in 2014. To date, 250 classrooms have participated in the Classroom Challenge. We are honored and privileged to continue to offer this experience to fourth-sixth grade classrooms in the Cal Water Service area, inviting them to develop and implement solutions for local water issues. Additionally, the Classroom Challenge for the second year in a row welcomes school-based clubs to participate as well.

**NEW THIS YEAR:**

**Learning Styles:**

The Classroom Challenge is evolving to meet your changing needs and to help you bring a relevant, meaningful, project-based learning opportunity to your students that transcends distance learning. Whether teaching remotely, in-person, or through a hybrid model, our new expert Teacher Ambassadors and advisors have developed a clear pathway to engage your students in real-world inquiry while helping you meet your curriculum goals.

**New Resources:**

And we’re here for you! We will now be offering office hours to help you and your class meet your goals. Through the support of our teacher ambassadors, we will be offering virtual meetings along with an updated handbook, new video guides, and additional resources to make your Classroom Challenge an amazing and smooth experience!
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Design Over Implementation:
Additionally, understanding the hurdles of distance learning, and the need for an equitable, fair competition, this year’s Classroom Challenge shall focus on designing solutions to care for water. What does that mean for you? Judges will not be seeking fully implemented projects, but looking for complete designs, that have been tested and refined, with the aim to address a local water issue. Perhaps your design will be a way to keep garbage out of the storm drains and prevent it from traveling to the ocean. Maybe your students will design a way to clean up a local creek or waterway. Your students may even create an engineering design for testing or cleaning water on campus. Whatever your students choose to do, you shall have our support, and we look forward to seeing their ideas!

Evelyn Guerrero
1370 N. St. Andrews Place
Los Angeles, CA 90028
challenge.calwater.com

Carolina Biological Supply Company
Carolina Biological Supply Company is a worldwide leader in science education, providing top-quality science and math materials for K-16 educators. Products, kits, and free teacher resources are available at www.carolina.com.

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Carolina Curriculum
For over 90 years, Carolina has provided science education materials and curriculum to schools and colleges in the U.S. and around the world. Science education is, and has been, our focus. Exclusively. We are dedicated to doing this one thing well.

We believe that students learn science best by doing science and our products are based first and foremost on this principle. Research shows that all children benefit from this hands-on approach, but that disadvantaged children benefit most.

Many of our employees have been teachers, with first-hand experience in the classroom. All our developers were once teachers. They know what works in the classroom – and what doesn’t.

We are the proud developers of the California adopted Building Blocks of Science 3D for Grades K-5, a hands-on, phenomena-based program with easy-to-follow, 30-minute investigations.

This program now includes the new BBS3D@HOME addition that makes distance teaching and learning a seamless transition from learning at home to being back in the classroom.

Carolina Curriculum has been partners in publishing and development with the Smithsonian Science Education Center for over 30 years. The Smithsonian offers a K-8 solution with Smithsonian Science for the Classroom and STC for Middles School, that sets the standard in 3D learning and 3D assessment. SS@HOME and STCMS@HOME allow teachers to transition between distance teaching and learning when students are at home and when they are back in the classroom.

While digital experiences can’t replace real hands-on learning and the intuitive, personal understanding a student develops in this way, they can complement hands-on learning and provide insight into student progress. We use digital resources where they complement hands-on experience or provide insights about learning progress – the things digital resources do best.

We build our own kits in our own fulfillment warehouse – no outsourcing to third partners – so you know you can get materials when you need them.

We pride ourselves in our product quality and service to you. Customers willingly refer us to other teachers.

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We sincerely hope that you have more fun and are more effective than ever when you use our products.

We won’t stop until you say, “My students can’t wait for science class (and neither can I)!”

Kristen Evanishyn
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Discovery Education, Inc.
Discovery Education is the global leader in standards-aligned digital curriculum resources, engaging content, and professional learning for K–12 classrooms. Through its award-winning digital textbooks, multimedia resources, and the largest professional learning network of its kind, Discovery Education is transforming teaching and learning, creating immersive STEM experiences, and improving academic achievement around the globe. Discovery Education currently serves approximately 4.5 million educators and 45 million students worldwide, and its resources are accessed in over 140 countries and territories.

Inspired by the global media company Discovery, Inc., Discovery Education partners with districts, states, and like-minded organizations to empower teachers with customized solutions that support the success of all learners. Explore the future of education at?DiscoveryEducation.com.

Amy Davis
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discoveryeducation.com

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The Exploratorium offers free resources, professional development, and lifelong support to teachers and professional learning providers who are working to bring hands-on, inquiry-based science learning to classrooms everywhere.

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**Gold Coast Science Network**
Gold Coast Science Network mission is to facilitate programs, outreach, and professional development; increase awareness of science literacy resources and opportunities; foster ongoing networking and collaboration; and promote science leadership.

Michelle Lourenco
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goldcoastscience.net

**Great Minds**
PhD Science from Great Minds PBC inspires students to wonder about the world and empowers them to make sense of it. The curriculum offers everything the California Department of Education deems necessary for elementary science students, completely adhering to the California Next Generation Science Standards (CA NGSS) and on the list of adopted science programs from the California State Board of Education. Emerging Grades K–2, to be available as an open educational resource, will follow the same high standards.

Unlike most other science curricula, PhD Science was based from the outset on A Framework for K–12 Science Education and the Next Generation Science Standards, and thus it incorporates a three-dimensional teaching and learning model into every lesson. Students build science knowledge and uncover Disciplinary Core Ideas by engaging in the Science and Engineering Practices, and they use Cross-Cutting Concepts to make sense of compelling, real-world phenomena. As a result, students go beyond reading about science to actually doing science. They take a deep dive into each anchor phenomenon, making observations, asking questions, developing evidence-based explanations, participating in discussions, designing and conducting investigations, and transferring their new knowledge to explain different phenomena.

PhD Science students use interesting, authentic trade texts and knowledge-building math content and have opportunities to practice writing by, for instance, keeping a Science Logbook. The interdisciplinary approach reinforces what students learn in other content areas, helping teachers make the most of their instructional hours.

Teachers tell us PhD Science is revolutionary for teachers and students alike. Julie Porta, a former elementary school instructional coach and now middle school principal of ABLE Charter Schools in Stockton, told us, “I would just reiterate what a fantastic program PhD Science is. I think it goes beyond a curriculum, that it really is a program, it’s a way to teach. And I mean really, it’s just the best that I’ve seen anywhere.”

Grades K–2 are available to pilot now and will be an open educational resource in 2021, reflecting the need for comprehensive scientific knowledge to begin at the earliest grades. Our Eureka Math began as an open educational resource. Its core files remain available to anyone for non-commercial use, aligned with our foundational belief that all students deserve access to high quality curriculum.

Grades 3–5 of PhD Science are in widespread use around the country. PhD Science in Sync™ adapts the curriculum, with teacher-taught video lessons and science journals as fillable PDFs, for continuous learning wherever teaching and learning take place. Materials for both versions are available in Spanish.

PhD Science Grades 3–5 are all top-rated on first submission by the Louisiana Department of Education, highly respected for its curricular leadership. PhD Science was the first science curriculum to earn a Tier 1 ranking from Louisiana.

Great Minds PBC provides exemplary curricula to schools and districts nationwide, inspiring joy in teaching and learning. Using knowledge-impacting texts and a cohesive, comprehensive lesson design from the earliest grades, students earn a deeper, more complete understanding of the subject matter than disparate materials could provide, preparing them for success in education and in life. Teachers and scholars with years of expertise write the curricula and support fellow educators with the professional development and best practices insights needed for successful implementation. Great Minds offers Eureka Math®, Wit & Wisdom® (English language arts), PhD Science®, math and English assessment tools, and created in collaboration with Wilson Language Training. Geodes® books for emerging readers. The Great Minds motto: Every child is capable of greatness.

Read more at greatminds.org and greatminds.org/science.

Cristina Hohmann
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greatminds.org

**Green Ninja**
Green Ninja is a comprehensive science curriculum for grades 6-8 that has been adopted by the California Department of Education as an approved publisher. Our curriculum follows a project-based approach where students apply standards-based science and engineering towards solving a local or relevant environmental problem. Get access to a FREE UNIT, see below.

Our program is delivered through a digital platform, but we also provide printed materials such as a Teacher Companion and Student Workbooks. All student facing materials are also available in Spanish. We also offer hands-on kits and professional development training for teachers.

Our team has developed a Remote Learning Program to help teachers plan for and teach remotely during the 20/21 academic year. The program is designed around hyperlinked slides that both teachers and students use for content, investigations, and assessment. The team has curated a version of the original curriculum for a remote learning environment to ensure a high-quality and engagement-rich science learning experience. The Remote Learning Program can be provided to teachers and used immediately, or easily modified to meet the needs of teachers and students. The program is built around a Google Classroom experience (i.e. Google Docs, Slides, Forms), but accommodations can be made for use with other learning management systems.
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Schedule an appointment to meet with one of our team members and learn more! Visit our website at www.greenninja.org and register for your guest account to see a sample of the new Remote Learning Program. Mention the CASE conference in the sign up form and we’ll upgrade your access to a FREE UNIT OF INSTRUCTION!

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Impact Science Education
At Impact Science, we know you need a curriculum that is flexible enough to adapt to the needs of your students. Our middle school programs engage students’ curiosity with real-world phenomena, connections to their own experiences, and engineering design challenges that get them talking and thinking.

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Our phenomena and assessment items can be modified or customized into your own assessments, or you can use our pre-made assessments, which we’ve built into Diagnostic, Formative and Summative assessments.

Diagnostic assessment items aim to address background knowledge students should bring to your classroom from prior grade bands.

Formative Assessments measure student progress toward a performance expectation, allowing students to represent understanding of concepts through models with 2D and 3D questions.

Summative Assessments are written to fully encompass all the aforementioned assessment types and include questions that fully meet performance expectations.

We offer free pilots for schools and districts! Find a time to chat with us here: https://calendly.com/c/HAAQMRYGM4ZJOEWF

Brendan Finch
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Inq-ITS by Apprendis
Inq-ITS (Inquiry Intelligent Tutoring System) is an online educational environment for science. Inq-ITS puts students in control of their own learning by leading an authentic inquiry experience through our NGSS-aligned virtual labs. As students work, Inq-ITS uses patented algorithms that automatically assess students and generate real-time reports on classroom-wide and student-specific performance for educators. Teachers also receive real-time alerts as to which students need assistance and on what skills. Rex, an AI virtual tutor, can also help students in real-time as they move through the virtual labs. The distinctive design behind Inq-ITS provides necessary resources for teacher instruction and assessment, and for student education on critical science and learning skills.

Charity Staudenraus
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(844) 446-7487
inqits.com

Lab-Aids
Lab-Aids exclusively publishes and creates materials for secondary science curricula developed by SEPUP at the Lawrence Hall of Science. We prioritize concrete experiences for students, designed for current research practices. Learn more about Lab-Aids at www.lab-aids.com.

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Ryan Brusco  
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Dianne Ferrari  
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**Project Learning Tree**  
PLT’s professional development workshops inspire educators to teach students how to  
Think, not what to think- in the hope of creating a future of environmental stewards and engaged naturalists.  
  
Sandra Derby  
(530) 394-7003  
ucanr.edu/sites/PLT_UCCE

**Savvas Learning Company**  
(Formerly Pearson K12 Learning)  
Introducing Savvas, Your Next-Generation Learning Company  
You’ve known us as Pearson® K12 Learning, a global learning solutions company with a long history of empowering educators and helping students succeed — in the classroom and in life. For more than 120 years, teachers have trusted our educational materials to provide them the highest-quality, most innovative curriculum. Now, a new tradition of innovation begins.  
We are a learning solutions company that boldly embraces the intersections of new digital technologies, diverse classrooms, broad social trends, and new research-based teaching and learning practices that are transforming education as we know it.  
With distance learning in demand now more than ever, we offer the publishing industry’s most powerful learning management system, Realize. Our one-stop platform gives teachers the digital tools they need for remote teaching and learning, from digital access to their Pearson K12 Learning (now Savvas) content to the ability to customize instructions, upload content, and monitor student progress.  
At Savvas, we believe that science holds answers to new medical treatments, energy sources, climate change, and the future. We’re committed to the Next Generation Science Standards and STEM, because ours is a mission that supports science inquiry, evidence-based reasoning, and the sense of wonder that propels all learning. Our programs focus on active, student-centered learning, through blended print and digital curriculum that engages students in phenomena-based inquiry, three-dimensional learning, and hands-on investigations.  
We celebrate a rich legacy of learning that students and educators have come to know and trust. We’re honored and thrilled to usher in a new era of education, one that is more inclusive, more connected, and more meaningful to each student.  
  
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(503) 360-3596  
savvas.com

**Outside the Box 925**  
We inspire STEAM activities, speakers and programs. Energy and environment focused programs for awareness and action. STEM skills in underserved communities with updated class offerings, teacher PD and standards-based resources.  
  
Devon Jackson  
(925) 708-7628  
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EXHIBITOR DIRECTORY

School Specialty Science Delta Education
Foss
FOSS® Next Generation, developed at the Lawrence Hall of Science, is the TK-8 science curriculum that empowers students to think like scientists and engineers. Students actively investigate real-world phenomena using science and engineering practices, disciplinary core ideas, and crosscutting concepts. FOSS provides teachers with the flexible resources they need to teach science in various learning environments with new tools to further support phenomena-based teaching and ELD instruction. FOSS is proven to engage and excite all learners, regardless of prior knowledge, language, or background.

Nicki Gorges
(920) 284-1608
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STEMscopes
STEMscopes CA NGSS 3D has been approved by the California Department of Education for use in grades K-8 as of November 2018.
The Next Generation Science Standards are complex and hard to unpack, but STEMscopes CA NGSS 3D’s award-winning curriculum design and embedded professional development make it easy for new and veteran teachers alike to teach to the rigor and depth demanded by these new standards.

Built on a digital platform, enhanced by print, and brought to life in hands-on kits, STEMscopes CA NGSS 3D employs 3D learning to comprehensively address the Disciplinary Core Ideas, Crosscutting Concepts, and Science and Engineering Practices through the student-driven inquiry of phenomena across flexible storylines.

Available in Spanish for TK-8.

Brooks Dougherty
5177 Richmond Avenue, Suite 1025
Houston, TX 77056
(805) 444-6214
stemscopes.com

Synopsys Outreach Foundation
The Synopsys Silicon Valley Science and Technology Outreach Foundation is proud to enable and celebrate K-12 students and teachers engaged in project-based STEM learning at schools across California.

We offer FREE project-based Science Project Packages to educators each fall, which include items such as poster boards, ribbons, stickers, and a classroom set of either science notebooks, magnifiers, or safety thermometers. Teachers within Santa Clara County are also eligible to receive their choice of a membership to CASE, NSTA, or RAFT.

The application period for 2020 is October 1 - October 19.

For more information on our Science Project Package Program (and how to apply), please see our website: https://outreach-foundation.org/teachers/

We are also proud to present FREE ‘SuperSchool’ teacher training for educators throughout the state of California. For more information on our upcoming Superschool trainings, please see here: https://outreach-foundation.org/programs/superschool-teacher-training-seminars/

Finally, we are thrilled to be able to support educators and students with more information on how to host (and participate!) in a project-based science experience through our SuperSchool 101 program. These trainings are now virtual and available on our website: https://outreach-foundation.org/programs/science-fair-101/

For more information, please say reach out to us at hello@outreach-foundation.org.

Katherine Naszradi
PO Box 61018,
Palo Alto, CA 94306
outreach-foundation.org
**EXHIBITOR DIRECTORY**

**TCI**
Founded and run by teachers, TCI’s mission is to transform science into a multi-faceted learning experience that blends the best technology with the best pedagogy.

Teaching science to kids is important because it allows students to explore the natural world around them. However, creating science lessons for kids can offer difficulty for teachers since teachers often must create their science curriculum while developing both lesson plans and class experiments with minimal time. The combination of time constraints and difficulty developing lessons can create a boring atmosphere for students, causing them to become disinterested in science.

TCI's Bring Science Alive! program solves these problems while supporting common core objectives and utilizing engaging student learning methods. Bring Science Alive! was created by teachers for teachers with active learning goals that give students a hands-on science learning experience. Students participate in in-class investigations, interactive online media, and engaging tests, getting them excited about science and improving their test scores. Teachers also benefit since the Bring Science Alive! program comes with customizable assessments, lesson plans, and experiments, saving teachers time since they don’t need to develop their science curriculum alone.

Bianca Chang  
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**Twig Education**

About Twig Education
Twig Education creates revolutionary STEM education resources for TK–12, including Twig Science, the complete program built for the 3-D NGSS, and Twig Distance Learning, which offers a quality and depth of instruction equivalent to the classroom experience. These give teachers flexible tools to tackle learning in hybrid, synchronous, or asynchronous settings. Our mission is to secure access, equity, and inclusion for all students through STEM experiences using theater-quality video and immersive hands-on and digital investigations.

Cheryl De La Vega  
17252 Green Lane  
Huntington Beach, CA 92649  
twigeducation.com

**UC Davis Young Schools Program**
The UC Davis Young Scholars Program is a research program for high-achieving high school students. Participants in the UC Davis Young Scholars Program will work one-on-one with research faculty and research groups with state-of-the-art laboratories for six weeks. Each student will work on an individual project and prepare a journal quality paper and symposium presentation about their work.

Application period: December 1, 2020 - March 15, 2021

Megan Bettis  
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Davis, CA 95616  
(530) 752-0622  
ysp.ucdavis.edu

**W. W. Norton & Company**
In 2012, W. W. Norton & Company created our High School Group to focus on what educators and students need to be successful in the high school classroom. Since then, we have developed student textbooks, instructor resources, and adaptive learning tools specifically for high school honors and AP® courses. We are committed to providing educators and students with what matters most: quality content and individualized support. Our reputation rests on consistently signing great scholar-teachers to author our textbooks and digital media; on expertly developing these materials through sustained collaboration among Norton editors and designers and classroom instructors; and on transparently and affordably pricing these materials. With a staff of six hundred and over four hundred trade, academic, and professional titles published each year, W. W. Norton & Company stands as the largest and oldest publishing house owned wholly by its employees.

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**Vernier Software & Technology**
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STEMscopes California was created by experienced educators to engage your students in the wonder of STEM. Comprehensive and research-based, we use a 21st-century approach and blend a digital platform with supplemental print materials and exploratory, hands-on kits.

**Designed for NGSS and the California Framework**

STEMscopes CA NGSS 3D is fully aligned to the California Next Generation Science Standards. We provide educators adaptable resources that empower hands-on science learning around meaningful, real-world phenomena.

**Grade Passback LMS Integration**

Integration with Canvas and Schoology allows you to assign and grade STEMscopes activities within your LMS.

**Support for Distance Learning**

With our dynamic digital platform, we're not new to distance learning. And we've made some major updates to support learning, no matter what your classroom looks like. Visit stemscopes.com/distance-learning for more information.

**A Learning Model that Works**

We base our curriculum around the 5E + IA learning model, which engages students in inquiry, hands-on investigations, and real-world connections for a deeper understanding of scientific concepts.

**Digital, Kit, and Print (English and Spanish)**

STEMscopes CA NGSS 3D combines digital and print resources and easy-to-use materials kits for a hands-on constructivist approach to any learning and teaching style.

**A Flexible Approach to Learning**

STEMscopes CA NGSS offers pre-made segments and storylines that move students from one area of content to another in a logical flow. We also give teachers the flexibility to create their own segments and storylines so that any sequence of content works to support student learning and inquiry.

**CAST Prep Assessments & Analytics**

Focusing on CA NGSS performance expectations and 3D-learning, our performance tasks use interactive 3D-graphics, drag-and-drop photo responses, and scenario-based digital simulations to challenge students’ thinking in a CAST-style question format.