

STEAM Conference

Session Descriptions and Presenters Info

Science

Mollie Behn

Subjects covered:

Science, Art (as it can be applied to STEM subjects), Mathematics, Environmental Education

Audience:

General Audience (any teacher from any grade) and Environmental Educators

Session description:

Mollie Behn will present on the 2nd Grade lesson series developed by the Coastal Watershed Council called "Where Does the Water Go?" Participants will engage in the same hands-on activities 2nd grade students take part in and learn how CWC blends math, science, art and real world environmental issues through three classroom visits and an optional field trip.

Activities incorporate Next Generation Science Standards performance expectations (2-ESS2-3, 2-PS1-1, 2-PS1-2 , K-2-ETS1-2) and focus on:

- Making observations of how water behaves on different surfaces and obtain information about groundwater as a source of water on earth.

- Investigating the movement of water through three earth materials (sand, soil, pebbles).
- Analyzing data from investigations to classify the earth materials based upon its ability to store and move water. Use evidence to explain how groundwater could infiltrate through the ground to enter the San Lorenzo River.
- Using the observable properties of the earth materials and knowledge gained from the investigation to develop a simple sketch, drawing, or cartoon to illustrate how the shape and spacing of the earth materials support the movement and storage of water.

Bio:

Mollie Behn directs CWC's Watershed Rangers education programs for Santa Cruz County schools inspiring youth to connect with, learn about and protect their local watersheds in collaboration with city and county partners. Prior to joining CWC Mollie managed experiential learning programs in the Pacific Northwest and worked for the National Park Service for seven years including serving as an Interpretive Park Ranger, in research and development for National Park Service-wide education programs and as Special Assistant to the NPS Deputy Director. Mollie holds a Masters of Education in Environmental Education from Western Washington University and a B.A in Public Policy from University of California at San Diego.

Joanne Brown and and Dan Lazarus

Subjects covered:

Science, Art (as it can be applied to STEM subjects)

Audience:

Grade: 3, 4, 5

Session description:

An Introduction To Nature Journaling Developing Habits of Scientific Observation & Questioning: A lesson designed for students in grades 3-5 Nature journaling uses nature and natural phenomenon as tools for scientific learning. This workshop is for teachers looking for a way to connect science and art and help students develop a stewardship and understanding of

the natural world. Teachers can use what they learn in our workshop to help their students observe, recall, and reflect upon their learning. We will share a journaling lesson adapted from John Muir Laws Opening The World Through Nature Journaling. We will look at how this lesson connects to NGSS Science & Engineering Practices and Crosscutting Concepts. We will be going outside, but our lesson can be easily modified for use inside the classroom.

Bio:

Dan Lazarus works as the Recreation Program Specialist at Quail Hollow Ranch County Park. There he runs environmental education field trips, organizes public education programs, and manages a large group of dedicated volunteers. Dan runs 2 different afterschool programs and has experience teaching students k-8 inside and outside. He has a Bachelor of Science in Environmental Studies and Sociology and loves sharing his passion for nature exploration with all ages.

Joanne Brown teaches at Alternative Family Education in Santa Cruz, where she helps K-12 students and their families plan homeschool curriculum. She has classroom experience teaching students in all grade levels. Joanne has a Bachelor of Science in Biology, a Master of Science in Ecology and a passion for environmental education.

Fred Mindlin

Subjects covered:

Science, Art (as it can be applied to STEM subjects), Mathematics, Theater Arts, Performance, Storytelling, and Literacy

Audience:

General Audience

Session description:

Science, Art (as it can be applied to STEM subjects), Mathematics, Theater Arts, Performance, Storytelling, and Literacy. String game storytelling is an interactive and collaborative process which fosters the development of executive functions key to numeracy, literacy, and creativity.

While my personal interest is in using string figures to develop ambidexterity in primary age students, there are ready applications from string games to learning algebra, trigonometry, the intricacies of topological representation, and myriad other facets of mathematics. String figures provide an engaging vehicle for learning anthropology, geography, and many aspects of social studies. The storytelling that I do with and about string games weaves together a wide variety of disciplines to create a unique reframing of the learning process itself.

Bio:

Fred is a Teaching Artist, an arts integration advocate & a social justice activist. He is an Arts Council Santa Cruz County Spectra Artist and does residencies as Visual and Performing Arts Teacher in Watsonville elementary schools and beyond. He is a Connected Learning Facilitator and teaches self-direction via real-world projects & string games through his String Stories Project, an Associate of the Arts Council.

Laurel Shastri

Subjects covered:

Science, Art (as it can be applied to STEM subjects), Art integration (specifically dance with science topics)

Audience:

3, 4, 5, 6, General Audience (any teacher from any grade)

Session Description:

The Scientific Dancer: Investigating, Experimenting, and Embodying Science through Dance

This workshop will provide an overview of a variety of science and dance-integrated lessons in an interactive and hands-on format. Dance integration in the classroom is a unique learning experience in which students learn skills and elements of dance along with subjects in the curriculum in organized and meaningful ways. Well-constructed dance-integrated lessons are

standards based, develop knowledge in multiple disciplines, and foster opportunities for student discovery and creativity.

Designed to challenge participants to think as both scientists and as dancers, this workshop alternates interactive movement activities with open-ended questions and reflection. Activities include:

- Skeleton Dance (Dance integrated with Science—Body systems). Participants will explore movement of the bones and joints of the skeletal system using dance and scientific vocabulary, and create a short movement phrase based on bones in the body.
- A Movement Experiment. Participants will apply scientific practices to distinguish between different types of movement, experiment to determine what happens when different movements are combined, and perform combinations of movement.
- Dance and the Coordinate Plane (Math, Domain specific vocabulary)
- Dancers use fixed points to map their location on stage. Stage directions are analogous to a coordinate system for graphing. Participants will explore location using both mathematical and dance systems.
- Erosion and Dance (Physical Science, Domain specific vocabulary)
- Participants will explore the dance elements of 'free flow,' 'bound flow,' and 'locomotor movements' to make connections with the geologic process of erosion by wind, water, and ice.

This workshop is geared toward upper elementary grade levels and is adaptable for students at any level. Next generation science, common core language arts, and VAPA dance standards will be addressed. No prior experience is necessary. Participants should wear comfortable clothing and shoes that facilitate movement.

Bio:

Laurel Shastri (M.S. in Geology) brings a unique perspective to dance. An experienced teaching artist, she specializes in integrating dance with diverse subjects such as science and language arts. She is part of Arts Council Santa Cruz County's Artist Teacher Partnership, co-facilitates teaching artist workshops, and serves in Montalvo Arts Center's Teaching Artist Program. She has presented workshops for educators at San Jose State University's Marion Cilker

Conference for the Arts in Education, Montalvo's Arts in Your Classroom Conference, Tennessee Art Commission's Creativity in Education, Arts 360 (Knox County, TN), National Association for State Arts Agencies, Value Plus, Southeast Center for Education in the Arts, and Arts Build. Her integrated lesson, 'Greetings Through Movement' is featured in the college text 'Creating Meaning Through Literature and the Arts,' by Claudia Cornett. She served seventeen years at Ballet Tennessee, as Associate Director, company dancer, faculty, and grant writer. She was on the faculty of the model outreach programs Dance Alive and Talent Identification Program. She is a faculty member of Dancenter with certification in Progressing Ballet Technique and performs with MoveSpeakSpin, a contemporary dance company directed by Karl Schaffer. In 2015, she was resident dancer at the Djerassi Artist Residency Program's Scientific Delirium Madness II. She is the recipient of Ballet Tennessee's 2018 Dance Alive Legacy Award.

Dorothee Ledbetter

Subjects covered:

Science, Engineering, Mathematics, ELD

Audience:

K - 12 teachers

Session description:

NGSS in Action - Phenomena and 3 Dimensions Through the Grades

During this interactive sequence with hands-on experiments, discourse, and teamwork, we'll explore:

- Why would I elicit prior knowledge first?
- What is a focus question, and how do I select it?
- Which phenomena do I choose to engage students, and where do I find them?
- How does the content (Disciplinary Core Ideas) progress through the grades? (Example Air, Water, Weather & Climate)
- How do the FOSS kits align with the Standards?

- How do I incorporate the Science and Engineering Practices and the Crosscutting Concepts?

Bio:

Dorothee Ledbetter, Ph.D., is a scientist (biology/ecology), NGSS Instructional Leads Team member, and Resource Specialist at AFE, an SCCS independent study program.

Pauline Seales

Subjects covered:

Science, Technology, Engineering, Art (as it can be applied to STEM subjects), Mathematics, Climate Change and listening

Audience:

Middle School, High School

Session Description:

How to put Fun and Hope into Climate Change education--present activities used successfully at local middle schools: Engage through a short demo and ppt. Explore climate.nasa.gov. Explain alternative energy with mini solar cells. Elaborate solutions through a draw-down activity.

Bio:

Degree in Physics. 20 years experience as a silicon valley engineer. Retrained for teaching. Taught high school physics, other sciences including AP Env. for 20 years. Now retired volunteer working with various local schools.

Hannah Sarver and Matt McConnell

Subjects covered:

Science, Technology

Audience:

5, 6, Middle School, High School teachers

Session Description:

This presentation will focus on the LiMPETS and Watershed Guardians community science programs provided through the Pacific Grove Museum of Natural History. Details covered will include the importance of community science (also known as citizen science), relevant supported program standards, STEM focused database application for 6th through 12th grade, and science communication.

Bio:

Hannah Sarver is the LiMPETS Program Coordinator. LiMPETS is a community science program for students, educators, and volunteer groups. Students 5-12th grade monitor the sandy beaches and rocky intertidal habitats of California's national marine sanctuaries, increasing awareness and stewardship of these important areas. LiMPETS has collected a large quantity of data at more than 60 sites and over 600 miles of California coastline. Annually, thousands of people collect baseline data. By monitoring, teachers, students, and community groups become the eyes and ears for our coastal beaches and rocky shores, detecting changes and possible problems affecting our coast.

Matt McConnell is the Watershed Guardians Program Coordinator. The Watershed Guardians Program reaches 6-12th grade students from the Monterey Peninsula, Salinas Valley and beyond. In the classroom students learn about the importance of the Carmel River Watershed as a local resource and as habitat for the federally threatened steelhead trout. In the field students assess human impacts by testing water quality at 6 different sites along the Carmel River. Students upload their results to a publicly viewable watershed health database online so that professional scientists and concerned organizations can monitor the health of the watershed over time.

Kevin Condon

Subjects covered:

Science, Natural history of birds

Audience:

4, 5, 6, Middle School, High School

Session Description:

As executive director and lead instructor for the Bird School Project, Kevin will be leading a session that shows how birding can be used to help students develop key practices in science and deepen their connection with the natural world.

Bio:

Kevin Condon is co-founder and lead instructor for The Bird School Project, a Santa Cruz based nonprofit that brings middle school students outside on their school campus to observe the world of birds. Kevin finished his degree in Environmental Studies at UC Santa Cruz in 2012. After graduating, Kevin worked as a field biologist in Yosemite, Sequoia, Grand Teton, Glacier, and Zion national parks. He spent two years as the teaching assistant for UCSC's Natural History Field Quarter and is certified by the Experiential Leadership Program at the UC Santa Cruz Recreation department, where he also worked as a Recreation Leader and as director of the Wilderness Orientation program for incoming undergraduate students.

Andy Carman

Subjects covered:

Environmental volunteering resource

Audience:

4, 5, 6, Middle School, High School teachers

Session Description:

This is a 15 minute presentation about: Environteers.org. Environteers.org is the key resource for accessing all 91 Santa Cruz County environmental organizations/entities and their volunteer opportunities and events. Presentation can be made in 15 minutes

Bio:

Andy Carman, PhD is the director of Environteers.org. The website promotes all of the 91 local environmental organizations and institutions in Santa Cruz County with a link to their respective websites. Furthermore the site covers upcoming environmental volunteer opportunities and events as well as local environmental news and interviews. For the past 2 1/2 years we have provided one portal for easy access to all local environmental organizations and their volunteer opportunities and events. There are no charges for including the organizations and their events on our site. We are a lean, all-volunteer group.

Technology

Charlie McDowell

Subjects covered:

Technology

Audience:

4, 5, 6, Middle School and High School teachers

Session Description:

This session will introduce participants to "CS Unplugged." We will look closely at two or three of the resources as well as get a broad picture of the range of resources available, from 5 minute "magic tricks" to hour long learning activities, complete with handouts and extensive teacher notes.

From the CS Unplugged website:

"CS Unplugged is a collection of free learning activities that teach Computer Science through engaging games and puzzles that use cards, string, crayons and lots of running around. We originally developed this so that young students could dive head-first into Computer Science, experiencing the kinds of questions and challenges that computer scientists experience, but without having to learn programming first."

"The collection was originally intended as a resource for outreach and extension, but with the adoption of computing and computational thinking into many classrooms around the world, it is now widely used for teaching. The material has been used in many contexts outside the classroom as well, including science shows, talks for senior citizens, and special events. (<https://csunplugged.org/en/>)"

Bio:

Charlie McDowell has been a professor of computer science at UCSC since 1985, including eight years as the Associate Dean for Undergraduate Affairs in the Jack Baskin School of Engineering. He has been using parts of CS Unplugged in his classes, in outreach to Santa Cruz area middle schools, and in a one-week summer camp for rising 8th and 9th graders for many years.

He is the author of "Java by Dissection" an introductory programming text book. He has been working with the National Center for Women and Technology since 2009 to increase women's participation in computing and technology.

Jordan Johnson

Subjects covered:

Technology, Art (as it can be applied to STEM subjects), Mathematics

Audience:

Middle School, High School

Session Description:

For years programming has been promoted as a medium for learning about math, but pseudo-algebra like " $x = x + 1$ ", common in programming, invites confusion. In functional programming (FP), programs are true mathematical functions. In this talk you'll meet DrRacket, a free, open-source FP kit designed for learners, and see Bootstrap, a project using FP to teach algebra. If you'd like to play along, bring a laptop with DrRacket installed; it's a free download from <http://download.racket-lang.org/>.

Bio:

Jordan Johnson is in his eleventh year of teaching at Kirby School, where he has taught geometry and programming. Fluent in Spanish and BCLAD-certified, he previously taught dual-language math and computing classes at the Latino College Preparatory Academy in San Jose. As a programmer, he is the author of the Racket language's web cookies library. Outside of school, he sings with a barbershop quartet, directs a chorus, and arranges music for vocal groups.

Math

Michelle Voorhees and Tammy Schultz

Subjects covered:

Art (as it can be applied to STEM subjects), Mathematics

Audience:

General Audience

Session Description:

An Introduction to using Islamic Tiles to develop geometry knowledge. We will be making constructions using a compass and straightedge. Student work will be shown.

Bio:

Michelle Voorhees is a 5th grade teacher at Watsonville Charter Schools (WCSA) for the Arts. She has been a program coordinator for MBAMP since 2012. At WCSA Michelle incorporates math, art and games at WCSA .

Tammy Schultz is a teacher in Santa Clara County. She has served on steering committees for MBAMP Since 2014. Tammy has also presented at California Math Council conferences and National Council for Teachers of Mathematics conferences.

Kevin Drinkard, Rebecca Setziol, and Suzanne Ebrahimian

Subjects covered:

Mathematics

Audience:

General Audience (any teacher from any grade)

Session Description:

Using Lesson Study to Improve Teaching and Learning in Math: Lesson Study is a collaborative and structured process for educators to work together to develop and test solutions to common instructional challenges. Learn how several local teams of educators are using Lesson Study to support their students to be college-ready, career-ready ... life-ready in math. We will share insights, examples, & protocols that you can adapt and use in your own context.

Bio:

Kevin Drinkard is the Math Coordinator in the Santa Cruz County Office of Education. He is a UCSC graduate and long-time math educator in our community

Rebecca Setziol: I am a Certified K-8 teacher and have been a public school classroom teacher for over 12 years. Always a math nerd, I am fascinated by how students learn and the many different ways of reaching kids. I've studied with Ruth Parker (Number Talk Guru), Dr. Takahashi (DePaul University, Lesson Study Alliance, and Director of Project IMPULS-International Math teacher Professionalization Using Lesson Study), SVMl (Silicon Valley Mathematics Initiative), Jo Boaler (Stanford Educator & author of *The Elephant in the Classroom: Helping Children Love and Learn Maths*), and with Mills College Lesson Study Group featuring Catherine Lewis (author of *Lesson Study Step by Step*).

During the summer of 2016, I traveled to Japan with Project IMPULS to learn more about Teaching Through Problem-Solving and Lesson Study. I saw students squeal with excitement when the math lesson started. I saw them persevere and challenge one another. I saw how one problem, one "just right" problem, a little out of the students comfort zone pushed them to work together, listen to each other, and fight with determination to prove their solution was correct. It was truly life changing!

I strongly believe that as a teacher, I am really a student. I am learning and growing along with my students- finding new ways of engaging them, asking deep questions to move their thinking farther, assessing their capabilities, and asking them to go one more step. My students are my teachers and each other's teachers. Teaching and learning is the name of the game. And Teaching Through Problem-Solving the best game around!

Suzanne Ebrahimian: I have been teaching since 1985, and over the years have seen many changes in math instruction. I have taught Kdg, 2nd, 3rd and 5th grade, and am now presently a

Math Coach at Boulder Creek Elementary in SLVUSD, where I get the pleasure of working with many teachers on strengthening their math programs. One of the most effective means of achieving teacher growth is through Lesson Study. Lesson Study brings together small teams of teachers to study a subject area, plan a research lesson, teach the lesson, and then to reflect on how well the students' needs were met, reassess their lesson and make improvements--always with the lens of improving student growth.

Karl Schaffer

Subjects covered:

Art (as it can be applied to STEM subjects), Mathematics

Audience:

General Audience (any teacher from any grade)

Session Description:

Clap Your Name: Mathematics, Rhythm, and Dance □ The mathematics of rhythm can be complex, and the ways rhythms are used vary considerably from culture to culture. Learning about rhythm using whole-body movement activities and clapping sequences allows us to gain new insights into important mathematical concepts such as least common multiple and other number theory properties, combinations and permutations, ratios, and aspects of patterning. In this workshop, we will see how to engage students in physical problem solving using rhythmic movement activities that develop their understanding of these mathematical concepts.

Bio:

Professional dancer and choreographer Karl Schaffer holds a Ph.D. in mathematics from the University of California, Santa Cruz and has taught mathematics at De Anza College since 1989. He has co-directed the Santa Cruz-based dance companies MoveSpeakSpin and Dr. Schaffer and Mr. Stern Dance Ensemble for 30 years. The company has performed its entertaining and highly physical works internationally, with special focus on dances integrating mathematics and movement. Schaffer and co-director Stern are on the Kennedy Center's

Teaching Artist Roster, and travel frequently sharing their math and dance integration methods in the classroom. Schaffer's recent concerts include The Daughters of Hypatia, on women mathematicians, which appeared recently at Montalvo Arts Center; Mosaic, on issues of culture, conflict, peace and justice in Palestine and Israel upcoming at Montalvo; and Pitter Pattern, an outreach show on rhythm, pattern, and shape. Schaffer writes frequently on mathematics and dance, and his writing appeared in The Best Writing on Mathematics 2012.

Pedro Morales

Subjects covered:

Science, Technology, Engineering, Art (as it can be applied to STEM subjects), Mathematics

Audience:

General Audience (any teacher from any grade)

Session Description:

MBAMP sponsors a monthly Math Teachers' Circle (MTC) where teachers meet to Enjoy mathematics among other math teachers. Experience the excitement of learning mathematics content and history with a supportive group. Gain knowledge and confidence. Rediscover the thrill of learning mathematics for its own sake. Come and see what a MTC Session is all about. Professor Pedro Morales will introduce π , different ways to relate π and randomness.

Bio:

I'm originally from Guatemala. I did my undergrad in electrical engineer and applied math. Then I came to the US and completed my PhD in mathematics at Baylor University. I worked for five years at UT Austin, where I was involved in improving calculus education and also organized the math teachers' circle of Austin.

Judit Moschkovich

Subjects covered:

Mathematics

Session Description:

Mathematics, the Common Core, and Language: Supporting Mathematical Reasoning for English Learners in Secondary Classrooms. This workshop presents research-based recommendations for mathematics instruction for English Learners (ELs) aligned with the Common Core State Standards. The workshop has three parts. The first part summarizes what research says about effective teaching for ELs and effective mathematics teaching. In the second part, I use two vignettes (each with a video clip and short transcript) to illustrate recommendations for supporting mathematical reasoning for ELs in secondary classrooms. The third part reviews principles, guidelines, and resources for math instruction for ELs. Lastly, there will time for reflection in small groups and questions.

Audience:

Middle School, High School teachers

Bio:

Judit Moschkovich (jmoschko@ucsc.edu) is Professor of mathematics education in the Education Department at the University of California Santa Cruz. Her research uses sociocultural approaches to study mathematical thinking and learning, mathematical discourse, and mathematics learners who are bilingual and/or learning English. Her work has been published in the Journal for Research in Mathematics Education, Educational Studies in Mathematics, the Journal of Mathematical Behavior, the Journal of the Learning Sciences, and Cognition & Instruction. She served as member on a Consensus Committee "Supporting English Learners in STEM Subjects," National Academies of Sciences, Division of Behavioral and Social Sciences and Education (2016-2019). She was named a 2018 Fellow of the American Educational Research Association (AERA) and received the 2019 Distinguished

Scholar Award, Special Interest Group for Research in Mathematics Education (SIG-RME), American Educational Research Association.

Kate Philpott and Kathy Mitchell

Subjects covered:

Science, Engineering, Mathematics

Audience:

2, 3, 4 grade teachers

Session Description:

Session Title: Curious George and the Hot Air Balloon Using this inquisitive & mischievous character to set the task, we will explore how math, engineering & science are each incorporated into an investigation. Learn by doing : using the 5 E's model, integrating ELD, facilitating a Science Talk, & leading a Math Congress.

Bio:

Kate Philpott is a Math Specialist and Coach. San Francisco Day School and Berkwood Hedge. As a classroom teacher for over 25 years my interest in how to integrate engaging STEAM investigations and projects into the self-contained classroom has motivated my current work with teachers and students. She has been on the MBAMP Steering Committee since 2016

Kathy Mitchell is a SCCS primary teacher and bilingual specialist. She has been on the MBAMP Steering Committee since 2012.