

MARCH 7, 2020

UCSC's Monterey Bay Area Math Project & Monterey Bay Science Project Present their 13th Annual Winter Conference



- 8:30 Registration
- 9:00 - 10:15 SESSION 1
- 10:15 -10:25 ... BREAK
- 10:30 -11:45 SESSION 2
- 11:45 -12:40 ... LUNCH (*bring your own*)
- 12:40 - 1:55 SESSION 3
- 1:55 to 2:05 ... BREAK
- 2:05 to 3:20 SESSION 4
- 3:20 EVALUATION in session 4

Presenters were asked to describe their presentation and explain their motivation for presenting the topic, as well as give a short bio. On the next few pages are their responses. The 19 presenters are grouped as **Science** or **Math**.

Science

- Pauline Seales (past presenter)

Retired science teacher now actively teaching climate education in local schools as a volunteer. These and other lessons posted at <https://scrucclimate.org/k-12-lesson-plans/>

I'll be presenting 3 new lessons inspired by demonstrations by Ca Ac Science and the Exploratorium at the Nov CSTA conference in San Jose. 1. Graphing and analyzing Keeling CO2 curve data 2. Weighing and analyzing a set of 3 inch cubes weighed according to how much CO2 is generated to make 2.5oz of food. Learning more about food production and also investigating the amount of water used to make each type of food. 3. Finding out how "Coral" goes white in warm water. Investigating to find the temperature where the color just changes. Learning more about coral and coral bleaching

- Dorothee Ledbetter (past presenter)

Dorothee Ledbetter, PhD biology/ecology, was a member of SCCS's NGSS Instructional Leads Team and participated in this year's Phenomena Summit as a lead teacher. She is, as the resource specialist at AFE (an SCCS independent study program), now presenting eight monthly science nights that introduce staff, parents, and students to the "ingredients" of climate change and also how to teach with phenomena, the NGSS 3 Dimensions, and the 5E Instructional Model.

An introduction to an NGSS-aligned climate change series with hands-on experiments. The series topics are: Nature of Science, Water, Air, Carbon, Light & Heat, Evolution & Ecology. I have participated in SCCS's NGSS Instructional Leads Team, and the Phenomena Summit. I'm still excited about the NGSS and now in the middle of eight monthly science nights at AFE that introduce staff, parents, and students to the "ingredients" of climate change and also to phenomena, the NGSS 3 Dimensions, and 5E Instructional Model.

- Chelsea Prindle

Chelsea Prindle the manager of Monterey Bay National Marine Sanctuary Exploration Center. Ms. Prindle is dedicated towards exposing students to field-based science and has over 15 years experience in informal youth education.

Using Oceanography as an Example of Science and Technology working together! This session will introduce the impact of a field-based oceanographic field program on the Santa Cruz Wharf. This session will introduce teachers to the benefits of field-based hands on programs such as the Wharf Oceanography program and show the diverse classroom connections. Additionally, we will introduce other NOAA Citizen Science programs that are available to local teachers. Our motivation for offering this program is that we want students to get into the natural environment and use REAL scientific tools to explore science. Science and technology are inherently linked, and by doing real science students can learn both simultaneously.

- Kevin Condon (past presenter)

Kevin Condon is the director and co-founder of The Bird School Project. Bird School provides programs to middle and high school students throughout the Monterey Bay, helping science classrooms launch exploratory journeys understanding the world of birds. Jeff Manker is the president of the Monterey Bay Birding Festival and former high school teacher at Gilroy High where he taught California's only high school Ornithology course for nearly a decade.

Bird School Project will be presenting on how to engage students in outdoor, citizen science projects that can anchor science classes in observable, unpredictable phenomena, right outside their classroom door. The group will learn to use binoculars, explore various type of bird field guides, and learn the essence of what it means to be a birder. We'll get a hands on opportunity to identify many of the common species that can be found on UCSC's campus and practice all the skills of a scientist. Jeff Manker and Kevin Condon are interested in giving teachers the skills to facilitate their own bird walks with students and prove that it isn't nearly as hard as it seems to launch an investigation of the world of birds for your students.

- Will Franzell

As an Educational Administrator at MCOE, Will is responsible for facilitating Science Professional Learning Opportunities with TK-12th grade educators and administrators in Monterey County. He is available to meet with your team throughout the school year to provide support with the Next Generation Science Standards build capacity at your sites. His skills include designing, developing, and implementing workshops aligned to the NGSS while approaching this work with a combined lens of empathy and equity. Will looks forward to working with your team in order to foster creative confidence through innovation, collaborations, and deeper learning experiences. Will can help transform your school communities so all students have access and support to be successful in college, career, and life.

In this interactive session, experience how literacy strategies for communication and language development support students acquiring deeper understandings of science content. Start with a phenomenon, review a range of instructional practices, and reflect on what to try in your own classroom. My motivation is to support scientific literacy for ALL!

- Mollie Behn (past presenter) & Samuel Adelson

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. 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. Sam Adelson works with Santa Cruz County schools and community organizations to educate local youth on water conservation, nature exploration, stormwater management, pollution prevention and water quality monitoring. Sam supports the development of CWC education curriculum and leads in-class lessons, field trips, after-school activities and summer environmental education programs. Sam holds a degree in Environmental Science, Technology, and Policy from California State University, Monterey Bay.

Mollie Behn and Samuel Adelson from the Coastal Watershed Council will present an overview of their 3rd grade lessons series called "Can Steelhead Trout Migrate Here?" The presenters will focus on how teachers can use science, technology and mathematics to help students understand the life cycle of steelhead trout, their migration patterns and factors affecting their ability to migrate. Mollie and Sam will bring hands-on activities for teachers to experience and the opportunity to reflect on how they might use these activities in their classroom. We'd like to take this opportunity to share our work so that more teachers know about our work and have access to the activities we use to teach about watershed science and river ecosystems.

Science and Art

- Fred Mindlin (past presenter)

Fred is a Teaching Artist, an arts integration advocate, and a social justice activist. He leads playshops on string figure storytelling, theater arts, and arts integration across many disciplines. He has done long- and short-term residencies as a Visual and Performing Arts Teacher in almost every Watsonville elementary school. He is also a Connected Learning Facilitator and teaches self-direction via real-world projects and string games through his String Stories Project. He was invited to present about his work at last year's National Storytelling Summit.

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.

Computer Science

- Mackenzie Baughman

Mackenzie Baughman is the Executive Director of the Code Naturally Academy, a Santa Cruz based computer science education company. She is interested in hearing experiences and ideas from teachers who either have taught computer science before or are interested in teaching it.

This session will lead teachers through coding basics.

Math

- Judit Moschkovich (past presenter and MBAMP Faculty Advisor)

Judit Moschkovich (jmoschko@ucsc.edu) is Professor of mathematics education UCSC. 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.

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. The presentation will last 75 minutes: There is a 15-minute presentation summarizing the research, then participants spend about 30 minutes in pairs or small groups working on each of the two math problems in the vignettes and discussing each of the two the video clips. Each small group discussion is followed by a 5-minute presentation of my analysis of each video clip (total of 10 minutes). There will be about 10 minutes for Q&A.

- Rebecca Setziol (past presenter)

I am a Math Consultant specializing in Teaching Through Problem-Solving (TTP), Number Talks, Lesson Study, and curriculum development. TTP is widespread in Japan, where students solve problems before a solution method or procedure is taught. Through modeling live lessons in classrooms, I offer teachers a new way to make their students' thinking visible. I work with teachers to plan lessons, units, assessments that marry curriculum and TTP with the Common Core Standards. Additionally, I hold workshops to analyze school data and form school-wide mathematics plans.

TTP is what top countries use around the world. Instead of just giving a worksheet filled with calculation practice problems, students are presented with a word problem in which they must first make sense of the question and then find an efficient solution. When students see themselves as problem-solvers, they then think deeply and start making connections between mathematical concepts. Why Americans struggle in math Teaching Through Problem Solving (TTP) utilizing Math Journals makes student thinking visible, attends to all Mathematical Practices, provides intervention for struggling students and extension for high achievers while efficiently teaching the CCSS. Teachers will walk away: Having an insight into their students' thinking and misconceptions Anticipating students' responses Understanding the progression of the Common Core Feeling excited about teaching math In fewer lessons, you'll be able to address the mathematical practices and standards of the CCSS and increase test scores.

- Suzanne Ebrahimian (past presenter and member of the MBAMP Leadership Team)

I have had my teaching credential since 1985 and have seen many teaching theories come and go. I have seen how my math teaching was successful at times, and very unsuccessful at other times. For the past five years I have been a Math Coach for the San Lorenzo Valley Unified School District and am enjoying learning, sharing and collaborating with teachers and students. I enjoy being a catalyst that promotes effective math acquisition for my students through self-discovery and their teachers.

I would like to present a session on Math Workshop and how to implement it into classrooms. I am presently at Boulder Creek Elementary as a Math Coach and am a facilitator of a NIC Grant that we received through Santa Cruz County to bring Math Workshop to our school. I have researched and used many of the workshop methods and found success with it in my own class when I was teaching in many years in a general ED classroom. I found the practice was very successful to encourage Number Sense building, Place Value understanding and Fluency. It also allows a teacher the chance to check-in with students individually or in small guided math groups. The workshop model is fascinating and filled with so much potential.

- Louanne Myers (past presenter and member of the MBAMP Leadership Team)

After 35 years, Louanne recently retired from classroom instruction. For the past 15 years she has been, and continues, working as a math coach (San Lorenzo Valley) and professional development leader. She also teaches instructional methodology courses in math and science at National University. Her focus has been in instructional strategies that promote inquiry, number sense, logical, algebraic and visual reasoning, planning and thinking skills, collaboration and wonder.

This workshop will focus on activities for teachers wishing to use either a workshop model in their classroom or as a whole group activity. These engaging challenges have a focus on math, science and art. The activities will include both online and hands-on that promote inquiry, planning and problem solving. Many of these activities use tools that teachers already have in their classroom. Participants will be able to explore STEM toys, collaboratively solve structural puzzles, and discuss how to lead student discussions about noticing and wondering. Be prepared to have some fun. Laptop advised for the online activities.

Games/Math

- Cal Teach

Ten UCSC undergraduates who are studying mathematical games will present games that they are learning this quarter in Judith Montgomery's class. They will be choosing games to present from the list found on the MBAMP website (<http://mbamp.ucsc.edu/games-math-fair/>)

- Kevin Drinkard (past presenter)

Kevin Drinkard is the Math Coordinator for the Santa Cruz County Office of Education. Katy Scowcroft and Dylan Vahradian teach at Gault Elementary. Kelly Marquez and David Manier are instructional coaches in PVUSD.

Across Santa Cruz County, teachers are engaging parents/guardians in math activities during "Family Math Nights" to increase understanding of the value and purpose of the Common Core State Standards. Teams from our two largest districts (Santa Cruz City Schools and Pajaro Valley Unified School District), would like to share what they are doing to engage parents - in order to inspire their peers and engage more SC families in math. Our interactive session will include COE Math Coordinator Kevin Drinkard, Gault Teachers Katy Scowcroft and Dylan Vahradian, & Pajaro Valley Instructional Coaches Kelly Marquez and David Manier

Math/Art

- Sumita Jaggur (member of the MBAMP Leadership team)

Sumita Jaggur is a middle school math and science teacher. More recently she's become fascinated with geometric art and now teaches geometric art at her school site.

I have two options for presenting and Islamic Tiling Group shop. In the first option, I could help participants create a pattern from Samarkand (a pattern I learned last summer). The other idea I have is to teach how to create an underlying grid of more than one shape (normally with Steve we've focused on a square or hexagonal grid). In this option participants would not have a completed pattern, instead they'd have the basis for a more complicated pattern. My motivation for presenting is that I really enjoy doing geometric art and love teaching other people what I've learned. And I also want to support MBAMP

- Michelle Voorhees (past presenter and member of the MBAMP Leadership Team)

Michelle Voorhees is a 5th grade teacher at Watsonville Charter School of the Arts, as well as a teacher-leader for the Monterey Bay Area Math Project. Michelle has used Islamic Tiling curriculum with students in her class and at her school.

Introduction to DISCOVERING GEOMETRY THROUGH THE ART OF ISLAMIC TILING.
I want to present this because I love to draw and think about patterns and my students enjoy it.



- Johnnie Wilson (past presenter and member of the MBAMP Leadership Team)

Johnnie Wilson teaches in the UCSC teacher preparation program. He has taught math to kids in elementary and middle school. He has taught adults about teaching and math teaching here and abroad. He has been a part of MBAMP since the last century.

This will be a session on math and art. I will lead participants through activities in art and math and then work with the participants to make sense of the things art and math share- in terms of the nature of materials, representing ideas, problem solving, critique and talk. In short - how does thinking like artist help us think like mathematicians, how does doing math make us better artists.

Dance/Math/Science

Science

- Laurel Shastri (past presenter)

Laurel Shastri (M.S. in Geology) brings a unique perspective to dance. An experienced teaching artist, she specializes in integrating dance with diverse subjects. 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 Monterey Bay Area Math Project's STEAM conference, 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.

Creativity and analysis are not on opposite ends of a spectrum, but are complementary ways for exploring and understanding the world around us. By finding connections between seemingly unrelated subjects, we can bring a new relevance and excitement to learning. This session, titled 'The Scientific Dancer: Using Dance to Embody and Investigate Force & Motion,' is a dance-integrated lesson demonstration that will tap into the power of kinesthetic learning to embody and express scientific knowledge through dance. This lesson alternates between hands-on dance activities and guided questioning to explore the behavior of gravity, friction, balanced forces, pushing, pulling, and stillness. Participants experiment moving with and against different forces and experience the effects of force on their bodies. The session culminates as participants create and perform movement phrases that demonstrates knowledge of different forces and dance skills. This lesson is geared for upper elementary students and would be appropriate for middle school science students as well. Relevant science standards, common core language arts, and VAPA dance standards will be addressed. Tools for assessment and evaluation of creative work are included. No prior experience is necessary. Participants should wear comfortable clothing and shoes that facilitate movement.

Math

- Karl Schaffer (past presenter)

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 company Dr. Schaffer and Mr. Stern Dance Ensemble for 30 years. Operating under the auspices of MoveSpeakSpin, 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. He writes frequently on mathematics and dance, and his writing appeared in The Best Writing on Mathematics 2012.

How Many Ways to Shake Hands: Counting Movement Sequences Handshakes are a worldwide custom. Some handshakes are ordinary, some are more unusual. Children are especially creative with handshakes, often inventing complex "secret" handshakes. In this activity we approach handshakes with some fresh questions. What are some new ways to shake hands? How many ways can two people shake hands? How can all pairs of people in a group shake hands? These questions lead us deeply into specific mathematical problems as well as a variety of open-ended movement exercises. Note: the activities in this workshop inspire participants to delve into open-ended problem-solving and collaborative explorations of simple sounding counting problems.

<https://www.youtube.com/watch?v=Ws2y-cGoWqQ>