

# OSTA 217 Conference - Session Descriptions

## Session #1 - 8:00 - 8:50

### **SS102 - Jean Aguilar-Valdez (Portland State University)**

#### **Teaching Science to English Language Learners: Walking in Their Shoes**

This immersive workshop will give educators a personal experience learning science when the dialogue and curriculum is in a language the student doesn't speak fluently. Educators experience what it's like to learn science as if they were an English Language Learner, relying on visuals, collaboration, body language, the hands-on materials and science phenomena to teach them when language cannot. Strategies and best practices for teaching science to language learners will be shared and modeled, with discussions about the effectiveness of the strategies used to make learning science more accessible for those still in the process of learning the dominant language in the classroom.

### **SS104 - Jacquy Barber, Suzanna Loper & Carissa Romano (Lawrence Hall of Science)**

#### **Space Docking Failure: Phenomena, 3D Instruction and Amplify Science for Grades 6–8**

The Lawrence Hall of Science, University of California, Berkeley Experience how students investigate a failed spacecraft docking while figuring out principles of force and motion and engaging in three-dimensional learning. Participants will get a hands-on dive into Amplify Science for grades 6–8, engaging with this new NGSS-designed curriculum from The Lawrence Hall of Science.

### **SS107 - Julia Betts (PCC), Justin Mortensen (PCC), & Monica Gray (Madison High School)**

#### **Bridging the Gap: STEAM Guitar building for high school & community college students**

Join faculty and staff of Madison High school and Portland Community College's SE campus to discuss their pilot "PCC 2017 RAMP STEM Guitar Workshop" hosted this year. Eight students from both high school and community college participated in a collaborative, 15-hr workshop utilizing the NSF-funded "STEM Guitar" program as a framework. Students personalized, assembled, and played their own electric guitar. STEM concepts related to guitar building were explored through Module Learning Activities (MLA). Discuss the integration of STEAM into the workshop sessions, and feedback from participants about engagement, relevancy, and their perceptions of STEM career and education pathways.

### **TCB 217 - Carol Biskupic Knight (Beaverton School District)**

#### **NGSS Storyline Coherence for K-2: Phenomena and Context-Based Units of Study for K-2**

Experience an interactive and engaging overview of the Beaverton School District K-2 NGSS-focused units of study. Engage K-2 students in coherent, cohesive three-dimensional learning investigations centering on phenomena and relevant context with a literacy lens. Receive links to the actual units and information about the instructional decisions to help move student learning towards meeting the NGSS standards.

### **SS 204 - Mike Weddle (The Jane Goodall Environmental Middle School)**

#### **The JGEMS Endangered Species Project: Engaging Students with Charismatic Megafauna**

The Jane Goodall Environmental Middle School (JGEMS) endangered species project is an integrated project that provides an engaging and meaningful opportunity for students to apply their skills and knowledge from a number of curriculum areas to solve a real world problem, the survival of endangered species. Students not only learn about the physical and behavioral characteristics of their species, but also about the complex economic, social and cultural issues associated with their endangered species. This session will share resources for science classes as well as supporting curriculum ideas for other subject areas, as well as samples of student work.

### **SS 111 - Kristin Dotti (Catalyst Learning Curricula)**

#### **Data-generating Simulations that Add Math and Statistics to your APES/IB ESS or AP/IB Biology Course**

In this workshop two activities will be used as exemplars for data analysis and scientific thinking. First, teachers will simulate change in a population with unequal resource allocation, then use the data generated to write mathematical expressions describing factors influencing the population dynamics. Next, teachers will model the microevolution of seeds, then construct defensible hypotheses on data predicted for 100 to 1000 years. This workshop will use population dynamics phenomenon to make NGSS modeling and STEM analysis relevant to students. Both of these activities include materials and instructions that are ready for immediate use in the classroom.

**SS 112 - Linda Fergusson-Kolmes (PCC), Alfonso Garcia Arriola (ACCESS), & Jenny Woodman (IEEE Earthzine)**

**Bring the Spirit of Ocean Exploration to Your Classroom!**

When students are introduced to the scientific method, is the idea of exploring the unknown included? For scientists studying the deep sea this must be part of the process since 95% of the ocean is unexplored. In this presentation teachers who are Science Communication Fellows with the Ocean Exploration Trust will share their stories. The Ocean Exploration Trust is an international program centered on scientific exploration and STEM education launched from aboard the Exploration Vessel Nautilus. Curricular resources highlighting the interdependence of science, engineering and technology will be provided.

**SS 109 - Fred Totsch & Geoff Warren (Texas Instruments)**

**Using STEM to protect a pet!**

Is your Beagle regal? Is your Pug really smug? Do you go wow wow for your Chow Chow? If you're a pet lover, you'll love this hands-on STEM session! Come learn some coding to protect your pooch and keep your kitten smitten! This session will teach you the very basics of coding and challenge you to create a smart car that can protect your pet when the inside gets too hot. Appropriate for middle and high school, this session is the cat's meoowww!

**SS 116 - Roger Groom (Mt Tabor Middle School) & Robert Butler**

**Feeling the Earth Move: How GPS teaches us about Cascadia earthquakes**

This session will introduce classroom activities to teach about GPS-measured tectonic plate motions and how GPS is an essential component of ShakeAlert, the Earthquake Early Warning system. Participants will make their own "gumdrop" GPS station and interpret real GPS data of crustal movements. As encouraged by NGSS, this topic provides a bridge between Earth science, space science, technology, engineering, and math. These activities help students gain skills in "reading" time series graphs, calculating velocities, and using geometry while learning about engineering applications of science. Participants will receive DVDs of educational resources on Cascadia earthquake and tsunami science, hazards, and emergency preparedness.

**SS 120 - Chris Hedeem & Kate Fisher (Oregon City High School)**

**Engaging students in citizen science through WildCam Gorongosa**

Do you want to engage your students in citizen science? The WildCam Gorongosa citizen science project is a way to involve your classroom in the incredible recovery and restoration efforts supporting Gorongosa National Park. HHMI BioInteractive WildCam Lab provides students with access to trail camera data. Learn how to guide students through calculations of species diversity, richness and evenness. Even more importantly, help students draw conclusions based on their findings while building their confidence studying real-world problems. Their work can be part of the global effort to conserve and restore the park's native biodiversity. Please bring your own device.

**SCB 204 - Danna Hollander (Discovery Education)**

**STEM for All: Constructing a Bridge to Equity**

This session explores the blend of pedagogy and technology to create opportunities for equitable access to high quality STEM instruction for all students. Participants will explore the ways in which STEM-infused lessons, digital tools and high leverage instructional strategies raise the bar for ALL students and close the gap for students who are behind. Educational leaders will examine ways to capitalize on the power of technology to provide equal opportunities for all students engage in STEM.

**SS 121 - Tonia Humbert & Lorrie Andrews (Burnt River Charter School)**

**BRIARR House: A Residential Research Opportunity**

Learn about an unparalleled research opportunity for high school students. They will have the opportunity to enter into a highly enriched atmosphere for motivated students to participate in a quality natural resource and agriculture based curriculum. Participants are immersed in a place-based learning program unique to Oregon, living and learning in a variety of natural resource settings that provide hands on learning experiences related to ecology, agriculture, and vocational training.

**TCB 213 - Leslie Moclock (Rice Northwest Museum of Rocks and Minerals)**

**The Art of Earth Science**

Earth processes like mineral formation and the rock cycle are full of abstract concepts difficult to see or touch. Engage students with works of sculpture and other lapidary arts that demonstrate the importance of rocks' physical properties and spark curiosity about how different rock types are formed. Explore the way nature creates artistic beauty in mineral formation. This session discusses how aesthetic appreciation of stone and interest in craftsmanship can be gateways to understanding for NGSS Earth Science

standards.

**SS 122 - Bryan Rebar & Wendy Morgan (University of Oregon)**

**Steps Toward Realizing the Vision of NGSS: Self-paced Online Learning to Involve All Students in Science**

How can I update my lessons for NGSS? This session introduces incremental steps teachers can take to redesign their lessons, engage students as scientists, and include all students, especially diverse student populations, in authentic science investigations. We focus on specific aspects of NGSS, such as how to integrate engineering, and specific strategies, for example how to support English Language Learners, and provide guided planning exercises to prepare lessons. A self-paced online course offered by University of Oregon allows teachers to continue to learn about NGSS shifts and current perspectives on how to realize the vision of NGSS drawing on research.

**TCB 216 - Meagan Sternberg (North Clackamas School District)**

**Supporting Science Through Writing**

This session will focus on the interdependence of doing science and writing about science. The focus will be on how to support the improvement of writing skills while developing conceptual understanding of core science ideas. Participants will engage in a science investigation to create context for making thinking visible through writing. This will include specific techniques and strategies to scaffold writing for English Language learners and how to use science notebooks.

**TCB 208 - Chi-Ruei (National Taiwan Normal University)**

**The integration of Hands-on Making and STEAM Experience in Taiwan: Miniature Making Contest**

There are three learning styles of learners, including visual, auditory and kinesthetic. In most schools, the courses are designed for those eyes-on and ears-on learners. If teachers can provide a hands-on learning opportunities in their classrooms, kinesthetic learners will be more motivated and will have increased concentration. In this session, learn how the miniatures making contest, called PowerTech, integrates science, technology, engineering, art, mathematics and hands-on making in an efficient way. The empirical experiences of engaging students in hands-on making STEAM activities in Taiwan will also be discussed.

**Session #2 - 9:00 - 9:50**

**SS 104 - Fabienne Conrad (Lab-Aids)**

**Reproductions influence the growth of organisms.**

Reproduction is the third unit to be released from the Issues and Science, Third Edition from SEPUP at the Lawrence Hall of Science, University of California, Berkeley. It is a 3-4 week middle school unit that focuses on the ethical issues involved in using genetic information. Reproduction is fully aligned to the three dimensions of the NGSS and bundles the following Performance Expectations: MS-LS1-4, MS-LS1-5, MS-LS3-1, MS-LS3-2

**SS 102 - Jean Aguilar-Valdez (Portland State University)**

**Decolonizing STEM Education for Equity and Social Justice**

Much of the curricula in STEM education comes from a colonized mindset, meaning it is overrepresented with the histories, contributions, worldviews, and cultural values of predominantly white, European, male voices. The contributions of women and non-Western peoples to STEM are comparatively elusive. As a result, non-male and non-white students often feel as if STEM is not a subject that “belongs” to them, and does not welcome them readily. This workshop offers ideas, resources, and sample activities that push back on the colonized narratives within STEM education. The aim is to empower STEM educators to decolonize their curricula and teaching practice.

**TCB 217 - Carol Biskupic-Knight & Cristina Trecha (Portland State University)**

**Can NGSS Really Be Done at the Elementary Level?: A Research Based Professional Development Model**

Moving science instruction towards the NGSS shifts at the elementary level can be insurmountable given school and district constraints, barriers, and limitations when literacy is often the primary focus. What if we used a research based professional development pathway as a system wide support to move elementary educators to develop their own wonder of science? What if by building capacity in teachers through their own collaborative learning experiences they were able to engage students in a meaningful pursuit of knowledge, to think and act like scientists, thus providing the impetus needed to promote language and literacy? This workshop builds off of the learnings of the Math Science Partnership Grant: Expansion of K-6 NGSS Science

Instructional Specialists. Receive support and links to powerpoints for implementing a coherent and cohesive professional development model within a district to move science instruction into the next generation where rigorous science and rich language support each other.

### **SS 107 - Megan Brunner, Jay Well, & Stephanie Petro (Oregon State University)**

#### **Exoplanet 1061: Using Board Games to Increase STEAM Engagement and Interest**

Game-based learning provides a positive and motivating way for students to engage with complex interdisciplinary concepts. The OSU Bioenergy Education Initiative developed a board game, ExoPlanet 1061, which requires students to engage in science and engineering practices and cross cutting concepts while learning about emerging sustainable technologies and managing community resources. Exoplanet 1061 was tested with high-school students from underserved communities throughout Oregon as part of the OSU SMILE program. The collected data provides evidence that ExoPlanet 1061 can increase students' ability to communicate challenging scientific ideas and provide students connection to scientific concepts seen in their own communities.

### **SCB 204 - Christine Gleason (Activate Learning)**

#### **A Focus on Modeling in the Phenomenon-Based Classroom**

As one of the scientific practices embedded in the NGSS, developing and using models allow our students to imagine the unseen, make predictions, ask questions and develop further investigations. Taken from Investigating and Questioning our World through Science and Technology (IQWST), participants will observe an optical illusion phenomenon, then develop a model to explain how light interacts with things. Models are then shared, critiqued, and participants are guided to develop a consensus model.

### **SS 111 - Caitlin Everett & Charlotte Denis (Portland Metro STEM Partnership and Beaverton School District)**

#### **Biology for the Next Generation**

Learn about the content and instructional shifts called for by the NGSS high school life science standards. Make your course relevant and engaging with phenomena that connect to student interests and natural curiosity. Learn how to structure inquiry and engineering investigations with multiple designs to foster scientific discourse between students. Learn about opportunities for technology integration through simulations, data mines, and formative assessment tools. Resources and a full year NGSS-aligned biology course model will be shared.

### **SS 109 - Fred Fotsch & Geoff Warren (Texas Instruments)**

#### **ZOMBIE ATTACK!**

Get ready as you are immersed in the post-apocalyptic world that is infected with ZOMBIES! You must use your creativity and ingenuity to come up with a solution to a zombie attack! With a basic understanding of frequency and sound and a quick introduction to some basic programming on a calculator, you may just be able to thwart the...ZOMBIE ATTACK!

### **SS 116 - Berkeley Gadbow (Catlin Gabel)**

#### **Talking Science**

Want some strategies to engage ALL students in talking about science? Come learn how to use sentence frames, engage with diagrams, and use multiple tools for engaging students in talking science. You will see examples of strategies that work for students to begin scientific conversations in their groups. Your classroom will be transformed.

### **SS 112 - Alfonso Garcia Arriola (Portland Public Schools)**

#### **Research Presentation: An Examination of the Relationship between Professional Development Providers' Epistemological and Nature of Science Beliefs and their Professional Development Programs**

This research presentation presents the results of a study that examines the relationship between professional development providers' science beliefs and their design, development, and implementation of professional development experiences for science teachers. The presentation will discuss the implications and recommendations for the planning and design of professional development for science teachers.

### **SS 120 - Cheryl Ann Hollinger (Marylhurst University)**

#### **Springing Forward: Does Climate Change Cause Plants to Flower Earlier? Using Data Nuggets to Engage Students in Science**

Data Nuggets are hands-on activities designed to improve scientific and quantitative skills of students by having them graph and interpret scientific data gathered by practicing scientists. Students are challenged to answer a scientific question, guided through the

construction of graphs to facilitate data interpretation, and use data to support their claims. Multiple graphing and content levels allow for differentiated learning for students with any science or reading background, particularly culturally and linguistically diverse students. This workshop provides an overview of Data Nuggets and present a multi-level Data Nugget featuring data on climate change and flowering time of plants.

**SS 204 - Erin Lark (Covington Middle School)**

**STEAM-powered Eco Exhibits: A student interest-driven unit**

This workshop outlines unit in which students address human impact on the environment and human sustainability through creativity and collaboration. Students use Science and Engineering Practices to research content, design and build miniature modular exhibits that when combined with those of their classmates to make a whole-concept design. This unit can be customized to provide student choice and voice in learning design and products, is project-based, and can accommodate multiple grade bands. Additionally, it is appropriate for multiple grade levels, content access, and cross-cutting concepts. The unit can be delivered using multiple digital tools while providing opportunity for physical construction of models according to space and resource availability.

**SS 101 - Lisa Nyberg (California State University)**

**NSTA Press: The Power of Questioning and Investigating**

Learning about science begins with investigations of engaging questions: How does that work? How can I solve that problem? Why do things sink or float? How does the toy make sound? See how engaging questions and meaningful investigations help students build understanding of science concepts while giving purpose to literacy skill development.

How can you make learning accessible through the use of carefully selected questioning strategies that promote analytical thinking? Experience hands-on investigating strategies integrated in a dynamic model to engage powerful instructional practices focused on Common Core and Next Generation Science Standards!

**SS 122 - Bryan Rebar (University of Oregon), Darra Brennan & Ronda Fryer (Springfield Public Schools)**

**Project-Based Learning STEM Units Inspired by Professionals and Real World Problems**

In an open house format, 3rd-8th grade teachers share highlight hands-on activities included in their project-based learning units developed with guidance from university science and math faculty, science and math education specialists, and community professionals. Activities are designed to engage students in science and mathematics practices using project-based learning in which a driving question contextualizes the unit and creates a need to know. Projects lead to natural products shared with an outside audience. Teachers were supported as part of the math-science partnership project, Content in Context SuperLessons (C2SL) led by University of Oregon, and all lessons are freely available.

**TCB 208 - David Scharfenberg (Pleasant Valley School, Centennial School District)**

**Phenomena: Moving Student Learning Forward**

How do we use live phenomena (planned and unplanned) as well as ones we "borrow" (virtual) to engage students? How does the phenomenon serve to anchor science thinking and activity? What are the other ways to use phenomena other than as a unit kickoff? Come and find out how one educator uses phenomena in a 6th grade elementary classroom.

**TCB 216 - Meagan Sternberg (North Clackamas School District)**

**Mindsets in STEM Classrooms**

This session will focus on impact of mindsets on students in STEM classrooms. Participants will reflect on how their own mindsets can build barriers or affect access for historically underrepresented students in STEM. They will also explore strategies and resources on how to teach about growth mindset and foster academic mindsets for historically underrepresented students in STEM.

**TCB 213 - Joan Swafford, Rene O'Neil & Jay Well (S.M.I.L.E. & Oregon State University)**

**S.M.I.L.E. (Science and Math Investigative Learning Experiences) After School Programs supporting S.T.E.M. for 30 years.**

The SMILE (Science and Math Investigative Learning Experiences) program supports after school STEM activities for students in communities throughout Oregon. Participants will learn about the program and engaging STEM activities to share with students in the classroom.

## **Session #3 - 1:00 - 1:50**

### **SCB 204 - Michael Holst (NSA Endeavor STEM Project)**

#### **The "E" in STEAM is not to be Feared**

Are you finding "jitters" about incorporating engineering into your science program for "STEAM-ification"? This presentation will present various "hows" and "whys" without adding an engineering course for grades 1-12 science programs. The presentation is intended for preservice and "soon-to-be" STEAM teachers.

### **SCB 205 - Jon Roschke (Kid Wind)**

#### **Kid Wind - Renewable Energy Lessons and Materials:Workshop - Runs for 3 sessions. Session #1**

This workshop will introduce educators to the KidWind lesson plans, materials, and classroom activities. We will explore an easy-to-replicate classroom project that can bring renewable energy education to your students in a fun, meaningful way. STEM-focused and sustainably-minded, KidWind provides free curricula and door prizes so you walk away with what you need to implement wind energy in your classes, and maybe even compete in the KidWind Challenge . [www.kidwindchallenge.com](http://www.kidwindchallenge.com)

### **SS 102 - Randy Bell & Tyler St. Clair (Oregon State University)**

#### **Avoiding De-Natured Science: Activities and Approaches to Effective NOS Instruction**

Understanding the nature of science (NOS) is critical for responding to issues of the 21st century such as global climate change, renewable energy, and genetically modified foods. Our research-based session summarizes the major themes of NOS and engages participants in fun and thought-provoking activities designed to teach NOS to elementary and middle school students. These activities are aligned with the NGSS framework and we'll included key resources so that you can use them to enhance your instruction right away!

### **SS 109 - Greg Brown & Dr. Terry Talley (STEMscopes)**

#### **Using Argumentation as a STEM Strategy - Increasing Student Voice and Choice**

Join us as we will model successful implementation of consensus building through argumentation. Learn how to reduce teacher talk and increase purposeful student talk around intriguing science topics that matter. When bring ELA skills into the STEM classroom, the 21st Century Skills of communication and collaboration are a must!

### **SS 112 - Mike Collins (Vernier Software & Technology)**

#### **Integrating Chromebook with Vernier Technology**

In this hands-on workshop, you will use Chromebooks with various Vernier sensors to investigate biology, chemistry, and physics concepts. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

### **SS 104 - Emily Cunningham (Stephens Middle School), Eva Olafson (Salem-Keizer Public Schools)**

#### **NGSS, 5Es, and WICOR....Alphabet Soup**

Sometimes education feels like alphabet soup and there are always more letters to add to the mix. Come learn how it is possible to integrate the 5Es of lesson planning with AVID's WICOR strategies in an NGSS focused middle school classroom so that you can meet the needs of all of your students.

### **SS 111 - Kristen Dotti (Catalyst Learning Curricula)**

#### **Using Mitotic Division to Introduce Statistics in AP and IB Biology**

Teachers will turn the common "root tip mitosis lab" into an opportunity to practice two common statistical analysis procedures so students are prepared to analyze more complex data in future student-designed experiments. Teachers will calculate mitotic index in multiple focal fields, then perform a test of correlation and a chi-squared analysis on the data generated. Because students in AP/IB Biology perform this lab as required content, it is fantastic for teaching statistical tests with relevancy and connectedness to STEM subject while fulfilling NGSS and AP/IB requirements. Teachers will receive lesson plans needed to reproduce this activity in their own classrooms.

**SS 121 - Kathryn Fisher & Chris Hedeem (Oregon City High School)**

**Using HHMI BioInteractive Evolution Resources to Deepen Math Skills**

Students see math as something confined to their math classes, rather than as a lens through which to understand other disciplines. Come explore a free, accessible suite of resources connecting phenomena with real data generated by scientists, using activities in which students can build confidence and skills to tackle relevant questions about how populations change over time. This workshop will support and differentiate for all levels of learners, from middle school through AP and IB courses. Come see how easy it is to integrate relevant, interesting data into your life science curriculum!

**TCB 213 - Alfonso Garcia Arriola (ACCESS Academy, Portland Public Schools)**

**Shallow-Water Ocean Waves - A Simulation Activity**

This activity uses the simulated advance of surface waves toward shore to investigate changes in wave characteristics that eventually lead to breakers and surf. The simulation assumes an ocean bottom that slopes gradually upwards toward shore. After completing this activity, students will be able to describe the major characteristics of shallow-water waves, describe how these characteristics change as the water becomes shallower, and describe the water motions associated with shallow-water ocean waves.

**SS 120 - Noelle Gorbett & Jamie Rummage (Oregon Department of Education)**

**Advancing Coherent and Equitable Systems of Science Education**

In this session, we will develop a shared understanding of how formative assessment works and approaches to support equitable three-dimensional instruction. This work is in partnership with the Oregon Department of Education, University of Washington and University of Colorado-Boulder supported through a National Science Foundation grant.

**TCB 208 - Ronda Johnson (Woodburn School District)**

**How to Integrate STEAM Throughout Your Day**

You will learn to write poems and songs that include science vocabulary and how to integrate reading and writing into your science time and vice versa.

**SS 107 - Manuel Muro (Technology Learning Systems)**

**Discovering Electricity And Electronics**

Leveraging a low-cost kit (EP-50), each student can have first hand experience building simple electrical circuits to circuits as complex as building their own A.M. radio & A.M. radio station in a manner that integrates the arts while also furthering their interests in: science, technology, engineering, arts and mathematics and ultimately increasing their interest learning in general, i.e. beyond S.T.E.A.M.!

**SS 101 - Holly Neil (Valor Christian School International)**

**Essential Elements-Teaching Chemistry through hands-on learning**

Do you want to teach chemistry concepts through hands-on learning and connect to students' everyday lives? Using the 5E learning cycle approach, the workshop will prepare teachers to allow students to build on their own understanding on new concepts from both old ideas and their own experiences. Each educator will complete a hands-on lesson and take home the entire Essential Elements Guide with over 50 chemistry lessons and labs geared for K-4th and 5-8th. Each guide has the activity sheets, answer keys, vocabulary, and lesson extensions you might need to go teach it directly in your classroom. All of the lessons connect to the Next Generation Science Standards!

**SS 122 - Paul Ruscher (Lane Community College)**

**Exploring Earth & Environmental Science with GLOBE**

Teachers and students can create new learning opportunities by exploring their local environment, or learn about Earth systems through NGSS. Although the GLOBE program supports NGSS science across the spectrum of disciplinary core ideas, where GLOBE excels is in its versatility in the Earth sciences, particularly with respect to water, soils, weather, and climate. Opportunities for elementary and secondary level educators to bring new resources to their students abound. This workshop provides a crosscutting orientation to GLOBE and will establish participants' ability to help their students design experiments, participate in collaborations, and enter and visualize data. Online training opportunities will also be made available to participants.

**TCB 216 - Dan Toberman & Ellen Mintz (Activate Learning)****Structuring Discussion to Be Equitable and Rigorous**

The Framework promotes learning as a fundamentally social endeavor supported by collaborative and communicative norms. Yet, sustaining these norms requires teachers to examine and support K–12 students ways of talking so they all are able to articulate, make sense of, and evaluate each other's ideas. Walk away with ready-to-use tools that foster and assess productive talk and qualify for a chance to win an IQWST unit at the end!

**SS 204 - Debbi Warren (Retired Science/Anatomy Teacher, Medford School District)****Make it Relevant. Make it Fun. Make it About Me!**

Creating the human body systems out of clay, "The Mind Cannot Forget What the Hands Have Learned." This session will have you diving into science with gusto by making muscles, a simple brain and a heart out of clay. Your students will be 100% engaged, wanting more and so excited to return day after day to create their body and gain a wealth of information of how their body works. This relates to every student, no matter what their level of learning is. After teaching this for over 19+ years many of my students tell me that this connected them to their career goals for college!

**SS 116 - Nixon Xavier (STEM4Girls) & Nandhana Nixon & Ragini Dindukurthi (Westview High School)****G.L.I.M.P.S.E. of eCybermission**

The Three Musketeerets will walk through their journey of eCybermission and share their experiences from state, regional and national judging. They will also share their project, G.L.I.M.P.S.E., which won 1st place in 9th grade at the national event. The girls will explain the huge gains of bringing eCybermission to the classroom, and how to implement it. They are excited to bring an interesting session for the OSTA Fall Conference.

**Session #4 - 2:00 - 2:50****TCB 208 - Kip Ault (Darwinian Whimsy) & Jan Glenn (Lewis & Clark College)****Out on a Limb**

Limbs do wonderful things. They simultaneously hint at ancient shared ancestry while revealing their possessors' lifestyles. Sometimes the fossil record tells such stories, but so can an artist's eye trained to look for homologies among zoo animals. Is a giraffe more closely related to a warty pig or a zebra? What on earth is a whippomorph? Participants in "Out on a Limb" learn simple, rapid sketching techniques, then apply these skills in order to compare limbs, joint-by-joint from torso to toe, among several animals that can be visited at the Oregon Zoo.

**SS 204 - Barbara Bannister (Simply Science, LLC)****It Sounds Like Science**

Six great activities you can use to meet NGSS 1-PS4-1 and 4-PS3-2. I'll show you an easy way to make and store tin can telephones, a way to surprise students with sounds that travel through string, and suggest ways to extend science for interested or very capable students.

**SS 102 - Karen Blaettler (Blaettler Consulting)****M.A.D. Teaching: Models, Analogies, and Diagrams**

Do these kinds of questions sound familiar? How do you know atoms exist when they are too small to see? How long ago did the dinosaurs live? Which came first, the chicken or the egg? Abstract concepts challenge many students, no matter what their personal or academic background. Add the challenges facing second language, special needs, at-risk, or even TAG students. How can you help your students? Create a conceptual framework for all students using models, analogies, and diagrams.

**SS 109 - Greg Brown & Dr. Terry Talley (STEMScopes)****The Value of Scientific Writing Scientific Explanations in STEM, Claim-Evidence-Reasoning**

Join us as we are bouncing balls from three heights and recording the observation data for the heights of the bounces. Participants will analyze their data and create a "Claim" about the patterns observed using their data as evidence. Being able to argue the accuracy of the claim statement requires using data as evidence and being able to justify why it can be used to support the claim.

This strategy of Claim, Evidence, and Reasoning follows the best practices for STEM instruction as described by McNeill and Krajcik.

**TCB 217 - Carolina Cavedon (MSP Grant Teacher, Beaverton School District)**

**Academic Language Fostering Student Success: The Voice of the Learners**

On this presentation, 4th grade dual language students will share their experiences as they engaged on the Science Talk Strategy. Learners will discuss about their discourse successes and struggles as well as the impact of academic language on their leadership skills. Discussion time will be available at the end of the session for the audience to ask questions.

**SS 112 - Mike Collins (Vernier Software and Technology)**

**Integrating iPad with Vernier Technology**

In this hands-on workshop, you will use iPad with various Vernier sensors to investigate biology, chemistry, and physics concepts. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

**SS 111 - Kristen Dotti (Catalyst Learning Curricula)**

**Describing Data Using Central Tendencies, Graphs and Statistics in AP and IB**

Teachers will collect data on toy mice that have been subjected to a mutagen. The control and experimental groups will have equal means, but the variation in the data set will be extreme and impossible to ignore. Teachers will be taught how to guide students to choose the best graphic representation and appropriate parameters of central tendency. This workshop makes relevant the NGSS standards of “Analyzing and Interpreting Data,” “Using Math and Computational Thinking,” and “Obtaining, Evaluating and Communicating Information” while covering AP/IB content. The activities in this hands-on session include lesson plans for immediate classroom use.

**TCB 213 - Alfonso Garcia (ACCESS Academy Portland Public Schools)**

**On the Sea Level - Measuring Sea Level from Space**

Measuring differences in elevation of the ocean surface is a challenging task, but sensing instruments aboard satellites have made it easier and more accurate. This activity uses data acquired by the TOPEX/Poseidon altimeter to investigate the relationship between the topography of the sea surface and the topography of the sea floor. After completing this activity, students will be able to describe the use of a radar altimeter to measure sea surface height, describe the relationship between a sea floor ridge and the height of the overlying sea surface, and describe the relationship between a seafloor trench and the height of the overlying sea surface.

**SS 107 - Bradford Hill & Matt McCollum (Beaverton School District)**

**How are you hearing me? Engaging Students in a 3D NGSS Learning Progression.**

This presentation aims to introduce a cell phone and telecommunications project. This 3D learning progression, like the 5 others that make-up the Patterns Approach to Physics, integrates PBL, Modeling, and the science and engineering practices. We begin with the phenomenon of a cell phone call where the student asks “How are you hearing me?”. That launches us into telecommunications and a learning progression that targets all the NGSS wave PEs, in addition to how the ear works, coding a simple App to take binary digital information and convert it into a text message.

**SS 121 - Cheryl Ann Hollinger (Howard Hughes Medical Institute)**

**How Do Species Coexist?**

In African savanna ecosystems, large herbivores share similar habitats. How can they coexist without one species outcompeting all the others? Niche partitioning, using the same environment differently. Participants will be introduced to a classroom activity using real-world examples of niche partitioning and use dietary data obtained using new cutting edge technology that gives scientists a better understanding of how similar animals can live in similar habitats and minimize competition. Participants will analyze graphs, evaluate evidence using new sources of data, explain data trends, and describe how niche partitioning promotes biodiversity. This activity aligns to NGSS DCI: HS.LS2.A, HS.LS2.C, HS.LS2.D, HS.LS4.C

**SS 116 - Jennifer Kidder & Chris Morgan (NatureBridge)**

**Using phenomenon found in Pacific Northwest National Parks to bring focus and relevancy to student investigations**

NatureBridge in Olympic National Park provides residential environmental science education programs to middle and high school

students. Join us as we share how we use place-based phenomena found in our local National Parks to focus student science investigations. We will share simple tools and ideas for supporting science practices and cross cutting concepts.

**SS 120 - Beth LaDuca (Oregon Department of Education)**

**Hidden Gaps: Identifying Outcome Gaps At Different Performance Levels**

Focusing on achievement gaps in average scores can mask real differences between student groups at different performance levels. For example, what appears to be a small gap between female and male 8th graders in science disappears among low performers and appears larger among high performers (NAEP 2015). This presentation will use results from the 2015 National Assessment of Educational Progress and the 2015 Trends in International Math and Science study to illustrate why teachers may need to consider group differences at different achievement levels when planning instruction.

**SCB 205 - Jon Roschke (Kid Wind)**

**Kid Wind - Renewable Energy Lessons and Materials: Session #2**

This is a continuation of Session #1.

This workshop will introduce educators to the KidWind lesson plans, materials, and classroom activities. We will explore an easy-to-replicate classroom project that can bring renewable energy education to your students in a fun, meaningful way. STEM-focused and sustainably-minded, KidWind provides free curricula and door prizes so you walk away with what you need to implement wind energy in your classes, and maybe even compete in the KidWind Challenge . [www.kidwindchallenge.com](http://www.kidwindchallenge.com)

**SS 122 - Paul Ruscher (Lane Community College)**

**Cloudspotting**

Skywatching is a favorite pastime of many people. What one sees depends on chemical, biological, geological, and meteorological phenomena. We will provide systematic observation protocols which support NGSS concepts appropriate for any K-20 educator by talking clouds, contrails (note, not chemtrails), and aerosols, following GLOBE protocols, from one of the cloud protocol developers! Participants will receive GLOBE cloudspotting materials for use in their classes and training in atmospheric aerosols and optical phenomena.

**SCB 204 - Tania Siemens & Kayla Martin (Oregon Sea Grant)**

**A Phenomenal Menace to the West: Exploring the Science of Aquatic Invasive Species**

Quagga mussels, bull frogs, and nutria! These are all aquatic invasive species that each have an intriguing story to tell. The "Aquatic Invaders! Menace to the West" website and curriculum provide resources to help students learn about science as they discover the incredible impacts of these alien organisms. Student can even take action to address the aquatic invaders in their local watershed, bringing local relevancy to classroom learning. In this session, we will learn about some fascinating aquatic invaders and student projects, then do a hands-on lesson from our newly finished NGSS-aligned curriculum available at [MenacetoTheWest.org](http://MenacetoTheWest.org)

**TCB 216 - Dan Toberman & Ellen Mintz (Activate Learning)**

**Making Three-Dimensional Learning Meaningful for Students using Science Story Lines**

What if K-12 lessons could both meet the standards and leverage student curiosity about the natural world? Join us for an engaging workshop on three-dimensional learning and storyline coherence as a means to not only have pedagogy meet the NGSS, but also build on student ideas and questions about natural phenomena. One such unit from IQWST will be raffled off at the end!

**Session #5 - 3:00 - 3:50**

**TCB 208 - Sarah Anderson, Chris Wyland, & Nesa Levy (Southwest Charter School)**

**Place-Based Education: Bringing Science to Life**

This educational approach uses all aspects of the local environment as an integrated context for learning. Place-based projects promotes connection to NGSS through inquiry, problem-solving, and skill development. We will provide insight into the definition of place-based learning, examples of successful projects and an overview of how to identify partners and opportunities.

**SS 204 - Barbara Bannister (Simply Science, LLC)**

**It Looks like Science!**

Fun activities that use very simple, very common materials to meet NGSS 1-PS4-2 and 1-PS4-3. Can you find the light? What do

you see in the dark? What shadows can you create when you block the light? We'll explore these questions and more during our session about light

### **SS 109 - Greg Brown & Dr. Terry Talley (STEMScopes)**

#### **Demystifying STEM with a STEM Teacher Certificate**

Transformational STEM teaching is leveraged by the instructional strategies used and the planned interactions of students. These effective and engaging strategies will transform your program. Gain your STEM Teacher Certificate through NISE as you collect artifacts of these highly effective STEM Teacher Actions. To learn more join us in this interactive session!

### **SS 104 - Fred Fotsch & Geoff Warren (Texas Instruments)**

#### **Drought in Africa Inspires Students to Invent a Smart Irrigation System**

Come learn how to create a project-based camp or classroom lesson that enables students to apply concepts, such as photosynthesis and the water cycle, to design a smart irrigation system. Inspired by real-world events, students are motivated to apply problem-solving skills and learn some basic programming to come up with innovative solutions to the drought situation in southern Africa.

### **SS 111 - Greg Fowler (PSU & OHSU) & Caitlin Everett (Portland Metro STEM Partnership)**

#### **The Genomic Future? A classroom approach to implementation of NGSS heredity**

How do the NGSS Heredity standards call for a change in the way teachers approach this topic? As genomics continues to influence healthcare and our fundamental understanding and manipulation of our increasingly bioengineered world, it is becoming vitally important for everyone to have a basic understanding of the genome sciences and technologies, and the ethical, social and policy ramifications of their application. This is especially true for students who will be the beneficiaries of the promise of genomics in their future. In this session, teachers will learn about the future of genomics and genetic modification and will leave with a NGSS-aligned unit plan and lesson resources.

### **SCB 204 - Christine Gleason (Activate Learning)**

#### **Using Anchoring Phenomena and Driving Question Boards to Spark Student Questioning**

As one of the scientific practices embedded in the NGSS, asking questions and defining problems provides students with an authentic and meaningful entry point into science and engineering. Taken from Investigating and Questioning our World through Science and Technology (IQWST), participants will experience a puzzling chemistry phenomenon and learn how to elicit, organize, and revisit students' questions so that students feel ownership over their own learning.

### **SS 102 - Dr. Janice Gobert & Charity Staudenraus (Rutgers University)**

#### **Utilizing Virtual Labs to Differentiate Instruction**

Virtual science labs you can conduct and grade in under an hour! Learn about virtual labs (5th-10th) that grade themselves and allow students to practice authentically forming questions, collecting data, analyzing data, and communicating findings with a claim-evidence-reasoning framework. Students receive immediate, personalized feedback to promote equity in the classroom. Inq-ITS helps you monitor student growth, and immediately alert you when and how your students struggle. Participants receive a detailed rubric to use with hands-on labs, and a free trial to use Inq-ITS. Why spend every weekend grading lab reports when Inq-ITS will do the grading for you? BYOD!

### **SS 112 - Michael Holst (Multinational Youth Studying Practical Applications of Climate Events)**

#### **Practical Applications of Climatic Events (M.Y.S.P.A.C.E.)**

M.Y.S.P.A.C.E. is an international collaboration of students in grades 7-12 engaged in self-selected research projects on their local impact by global environmental issues. Students work at their school sites using locally generated and satellite-based remote-sensing data with support from NOAA, NASA, and industry partners. Students meet to discover global trends in their collective data and present their findings. STEAM is integrated as students learn and practice techniques of leadership; methods of data processing, analysis and interpretation; teamwork; and effective communication. Grants will be discussed as well.

### **SS 120 - Kimba Munson (Center for Teacher Effectiveness, formerly Chicago Public Schools)**

#### **Building Partnerships: Using Unconditional Positive Regard to Build Culturally Relevant Teacher-Student Teams**

Want to connect with your science students in culturally relevant ways? Want to stop the push and pull of the teacher-student relationship with challenging students and remove 80-90% of low level discipline issues from your science classroom? I can show you how to build the Teacher-Student Team with evidence-based techniques from Unconditional Positive Regard to "Teach-To's" to

diffusers to on-task behavior...after one request! Build a solid Team with culturally relevant techniques and spend more time TEACHING!

**TCB 217 - Apple Educator (Apple, Inc)**

**Enhancing Learning and Teaching in STEM**

Join us to learn how educators can use Mac and iPad to create and deliver engaging STEM learning experiences. You'll also discover how new resources can personalize learning and help students of all learning styles grasp challenging STEM concepts.

**SS 116 - Angie Ortiz-McNeese, Cheryl Bland & Andy Dupont (Ron Russell Middle School)**

**Connecting Natural & Social Sciences**

We will give three examples of how we integrate science, social studies, literacy and technology in a full-inclusion, high-poverty, culturally diverse middle school. In each curricular unit, we strive to make learning relevant by including current events, career pathways, and project-based experiences that maximize current technology in our classrooms. Our students are engaged learners who meet high expectations.

**SS101 - Stephanie Pearl (Bonneville Environmental Foundation)**

**Renewable Energy Inquiry and Engineering**

Stephanie Pearl is a 4th grade teacher at Creston K-8 in Southeast Portland. During this session, she will walk attendees through her own development process in designing rigorous NGSS and Common Core aligned units that engaged her students in renewable energy concepts. Teachers will undergo hands-on activities and receive materials to explore linkages between the engineering design cycle, literacy, three-dimensionality, and mathematics. Stephanie developed this curriculum with support from CE, a program of the Bonneville Environmental Foundation.

**SCB 205 - Jon Roschke (Kid Wind)**

**Kid Wind - Renewable Energy Lessons and Materials: Session #3**

This is a continuation of sessions #1 & 2.

This workshop will introduce educators to the KidWind lesson plans, materials, and classroom activities. We will explore an easy-to-replicate classroom project that can bring renewable energy education to your students in a fun, meaningful way. STEM-focused and sustainably-minded, KidWind provides free curricula and door prizes so you walk away with what you need to implement wind energy in your classes, and maybe even compete in the KidWind Challenge . [www.kidwindchallenge.com](http://www.kidwindchallenge.com)

**TCB 213 - Rachel Stagner & Treothe Bullock (Madison High School)**

**Exploring Climate Change Curriculum**

In May of 2016, the Portland Public School Board adopted a resolution mandating climate justice curriculum be taught in schools. In this session, we will share a high school "Climate Justice and Chemistry" unit that we implemented last school year, and--more importantly--we will facilitate a discussion where teachers can share curriculum and/or collaborate with each other. Please bring any resources you'd like to share!

**SS 121 - Brian Vollmer-Buhl & Leilagh Boyle (Cottage Grove High School)**

**Using Karyotypes-Modeling the Work of a Genetic Counselor**

During this session participants will model the work of a genetic counselor by examining the chromosomes of an individual to create a karyotype. This will be used to identify what chromosomal disorder the individual has. Diagnosis will be made based on data collected from participant create whiteboard posters. This activity concludes with a CER (Claim, Evidence, and Reasoning) paragraph on which chromosomal disorder is predicted to be most common in their county. All participants will receive master copies of all materials used in this session for use in their classrooms.

**TCB 216 - Mike Weddle (Jane Goodall Environmental Middle School & Diack Ecology Education Program) & David Blair (JGEMS)**

**Into the Woods: Field-based Research Projects**

The Jane Goodall Environmental Middle School (JGEMS), a public charter school in Salem, Oregon, has received a dissemination grant from ODE. One focus of the grant is to share our successful field-based research projects that provide a unique opportunity for students to learn critical thinking, data collection, comparative analysis, the ability to work in groups and presentation skills, both written and oral. This workshop will look at instructional and logistical strategies for getting students into the woods (or fields or wetlands). JGEMS is partnering with the Diack Ecology Education Program to provide grants for equipment for these projects.

## **SS 107 - Joe Zenisek (Molalla High School & Sophie Kirscht (Oregon City High School)**

### **Zombie Apocalypse! Escape from MHS! High School!**

Students work in engineering teams to design, build and launch hot air balloons to escape a zombie onslaught. In the process students engage in science inquiry, mathematics applications and engineering principles around the concept of density. This is just one unit of a disaster based curriculum developed to increase student engagement in core science concepts and processes. Each unit includes reading, writing, math, inquiry and engineering design incorporating NGSS Disciplinary Core Ideas. Participants will be given access to the entire disaster based curriculum which includes “Lost! Surviving Hypothermia!”, “Asteroid Strike!”, “Earthquake/Tsunami Survival!” and more! Applicable for both MS/HS.

## **Session #6 - 4:00 - 4:50**

## **SS 111 - Leilagh Boyle (Cottage Grove High School) & Brian Vollmer-Buhl**

### **Monster Babies! Genetic inheritance, evaluating adaptations, scientific explanations and art to engage diverse learners**

This student-centered activity allows students to design and draw their own fictional monster baby with specific traits based on the modes of genetic inheritance. Students then evaluate the inherited traits of their monster baby to determine what environment their monster baby is best suited to survive in. Finally, students practice constructing a scientific explanation based on evidence and reasoning. With embedded opportunities for formative assessment, this engaging activity is both meaningful and accessible for students with various learning styles. You will leave this session with a fun, classroom-ready activity you can use next week in your biology class!

## **SS 116 - Jo Cooper (Neah-KahNie Middle School)**

### **Science/Math Integration for a Sustainable Planet**

Discover hands-on activities on real-world human ecology concepts (population growth, natural resource use and biodiversity) while building foundational math skills. Participate in innovative activities that illustrate the science and math behind real-world issues. Presented strategies will include creating representational models with manipulatives, cooperative group problem-solving challenges, graphing and analysis, and role-playing simulations. Participants will receive activity instructions, data charts and background reading that link to Next Generation Science Standards and Common Core Standards for Mathematics.

## **TCB 208 - Fawn Custer (Oregon Shores/ CoastWatch)**

### **Citizen Science for Your Students**

For Teachers/Educators: Looking for ways to get your students more involved with stewardship and citizen science? Join other classes and schools who have adopted a mile of beach and participate in citizen science activities-- survey for marine mammals, beached birds, marine debris, sea stars and other animals, and help to document the year's highest tides through the King Tide Project. Adopting a mile as a class or school is a great way for children to learn about the natural world and how to protect it. Join this session to learn more about opportunities that can be continued back at your school and throughout the year.

## **SS 104 - Fred Fotsch & Geoff Warren (Texas Instruments)**

### **STEAM-a-lama-ding-dong...**

Music is a great way to get kids excited about STEAM. Learn how to use your calculators, a TI-Innovator hub, and some imagination to get kids excited about coding and engineering. This session will help any coding novice become comfortable with the basics by challenging them to create a popular song using a little imagination, cooperation, and coding on their calculator!

## **SS 121 - Lori Lancaster (Oregon Science Teacher Association)**

### **Be the Change You Want to See in Science Education**

Be a teacher leader. Advocate for science teaching and learning. Network and collaborate with colleagues all over the state. Testify to the role science education plays in Oregon's future. Energize science teaching and learning in Oregon. Learn how your voice can make OSTA a powerful force for teachers by teachers at this session. “Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that every has.” — Margaret Mead

**SS 112 - Peter Nelson (College of Earth, Atmospheric Sciences, Oregon State University) & Nancee Hunter (Portland State University - Center for Geography Education in Oregon)**

Your personal geography: 21st Century tools for developing your sense of place

How do your students develop a relationship to their local community and environment?

In this session, you step into the role of student and learn tools to explore your personal geography using satellite imagery, mobile data collection, 360-degree photos, 3D-printed terrain models, virtual globes, online maps, and scientific data. We focus on new geography tools facilitating students exploration and story-telling with the opportunity to be among the first to analyze, visualize, and contextualize spatial data. We will provide NGSS-based examples of natural and man-made phenomena for your curriculum as a daily focus or within a larger unit.

**TCB 217 - Apple Educator (Apple Inc.)  
Everyone Can Code**

We believe that coding is an essential skill. Learning to code unlocks creativity, develops problem-solving skills, and opens career paths. We think everyone should have the opportunity to create something that can change the world. Join us to learn about Everyone Can Code, a new approach to coding that gives everyone the power to learn, write, and teach code. You'll hear about the new Swift Playgrounds app that includes lessons for beginning coders. And you'll explore curriculum materials for middle and high school that make it easy to bring coding into your school.

**SS 120 - Morgan Parks (National Wildlife Federation) & Laurel Bates (Oregon Green Schools)  
Integrate Sustainability into Classroom & School to Meet NGSS & STEAM**

Co-certification partners, Oregon Green Schools (OGS) and National Wildlife Federation's (NWF) Eco-Schools USA will share comprehensive green school resources. In schools across Oregon, students, teachers and staff are making a difference in their communities through OGS programs that recycle, reduce waste, save energy, and conserve water. NWF's Eco-Schools USA program provides a holistic framework that combines effective "green" management of school grounds, facilities, curricula, and student experience through 10 Pathways of Sustainability. Together, OGS and NWF's Eco-Schools USA programs provide a platform for environmental-based STEAM, are connected to curriculum and standards including NGSS, and award schools with certification and recognition.

**SS 102 - Eileen Patrick (FOSS Science)  
Linking Science and Literacy**

The science and engineering practices of the new standards place much emphasis on communication through "constructing explanations" and "obtaining, evaluating and communicating information". Learn techniques to support ALL of your students to become effective communicators of their science thinking in all four domains of literacy. After participating in a common science experience, we will practice strategies to support vocabulary, language functions, reading, writing, speaking and listening. You will leave with ideas that you can use in your own classroom the next day.

**SS 109 - Charity Staudenraus (The Heritage Institute) & Heather Feinberg (North Marion School District)  
Using Current Events to Inspire your Students**

With technology around them 24/7 our students want to explore topics that pertain to them and the world around them. In this presentation we will discuss the differences between discrepant events and NGSS term 'phenomena'. We will discuss how you can use a current event to construct a unit, lesson, or project that will inspire your students. Active participation is welcome so please bring your best ideas to share and hopefully you will take away concepts to use in your classroom next week.

**TCB 213 - Cristina Trecha (Oregon Science Project)  
Increasing Teacher Access to NGSS PD: Building Authentic Online Communities in Real Time**

This active session is for educators and administrators looking for new ways to build authentic community around NGSS with their colleagues, district, or region. Bring your laptop and explore new ideas for how you can curate flexible professional development programs that meet the varying needs and schedules of your team. Learn how the Oregon Science Project - a statewide equity-focused professional development community - is using online tools, platforms, and facilitation techniques to bring Oregon's far flung teachers together in dialogue around teaching and learning science via NGSS. Rural, semirural, and large districts challenged by the logistics of in person PD are especially encouraged to join in this dialogue and exploration of increasing teacher access to NGSS!

## SS 107 - Dean Walton (University of Oregon)

### The Phenomena of gravity, electromagnetic energy and tracking an object launched into space

A consortium of Oregon Universities will launch a nanosatellite in 2019. Its mission, defined by NASA, is to be a tool for middle and high schools science classes. While in orbit, it will be broadcasting from space. The goal of this proposal is to provide a learning opportunity where student can plot types of satellite orbits including inclined, equatorial and Molniya orbits to figure out what each offers. It will also cover the electromagnetic spectrum, why radios of certain frequencies are used, and the information to build a receiver to track and communicate with this satellite, a first for Oregon.

## TCB 216 - Mike Weddle (Diack Ecology Education Program)

### Field-based Research - We will buy your equipment.

The Diack Ecology Education Program provides a system of grants, workshops and resources to teachers and students in Oregon to encourage them to participate in field-based science inquiry and ecology studies. Field-based science inquiry gets students out of the classroom and into the natural world. Field-based research projects also provide an engaging opportunity for students to learn critical thinking, data collection, comparative analysis, and written and oral presentation skills. This session will provide examples of projects from grades K – 12 as well as strategies for writing a Diack grant.

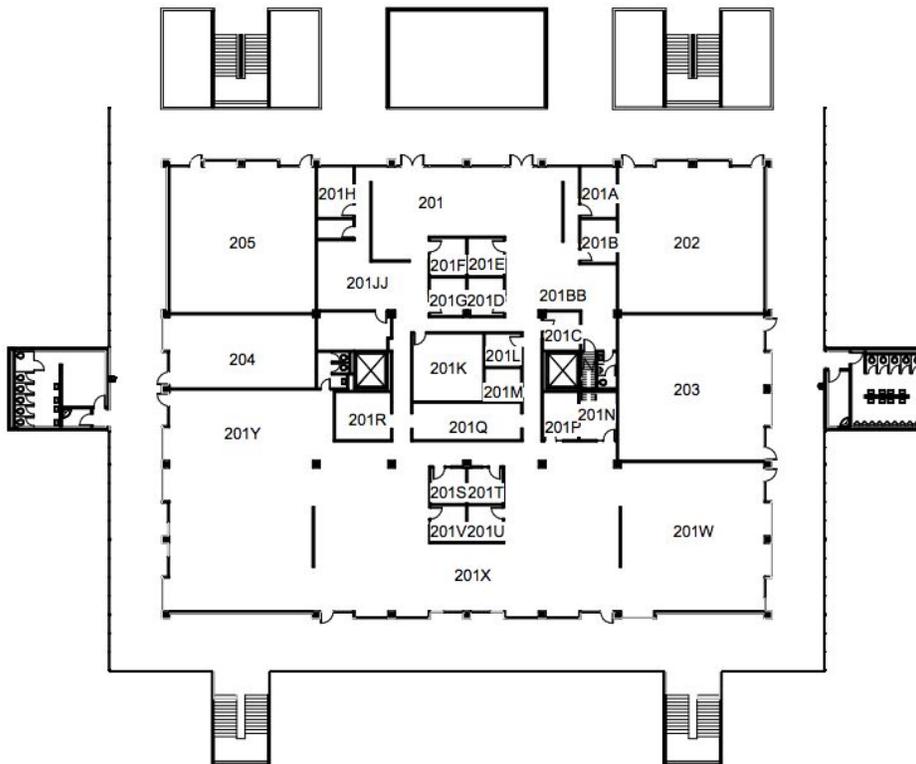
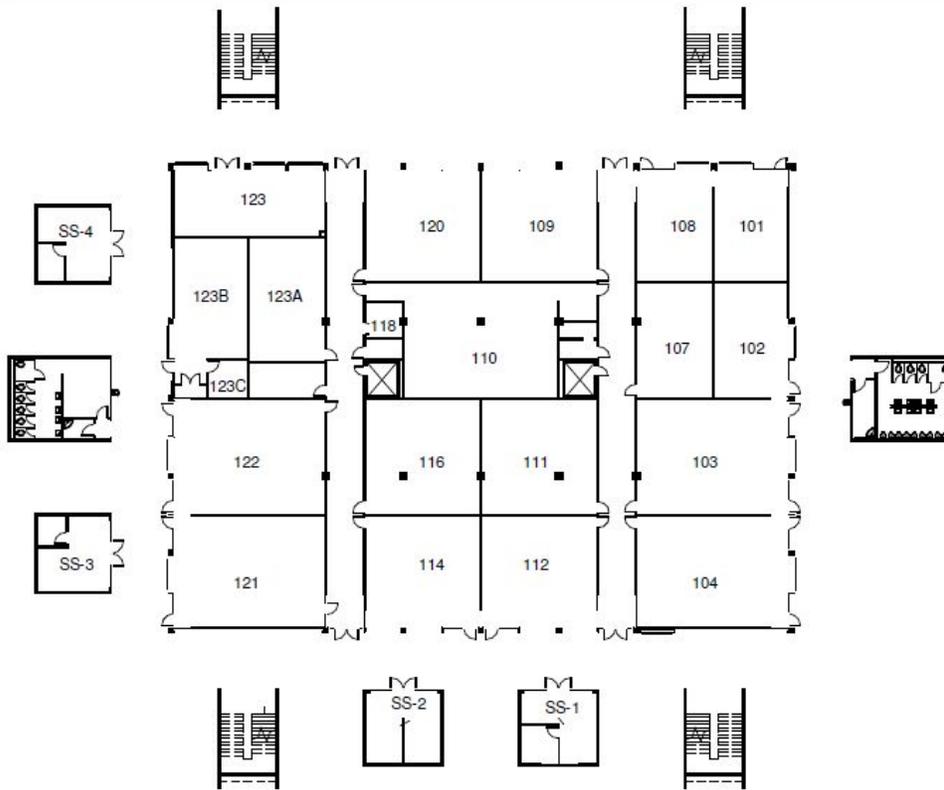
## Sessions at a Glance

Saturday Sessions						
	Session Times					
	Session #1	Session #2	Session #3	Session #4	Session #5	Session #6
Rooms	8-8:50	9:00 - 9:50	1:00-1:50	2:00 - 2:50	3:00 - 3:50	4:00 - 4:50
SS 101		NSTA Press: The Power of Questioning and Investigating	Essential Elements-Teaching Chemistry through hands-on learning		Renewable Energy Inquiry and Engineering	
SS 104	Space Docking Failure: Phenomena, 3D Instruction	Reproductions influence the growth of organisms.	NGSS, 5Es, and WICOR....Alphabet Soup		Drought in Africa Inspires Students to Invent a Smart Irrigation System	STEAM-a-lama-din g-dong...
SS 107	Bridging the Gap: STEAM Guitar building for high school & community college students	Exoplanet 1061: Using Board Games to Increase STEAM Engagement and Interest	Discovering Electricity And Electronics	How are you hearing me? Engaging Students in a 3D NGSS Learning Progression.	Zombie Apocalypse! Escape from MHS! High School!	The Phenomena of gravity, electromagnetic energy and tracking an object launched into space
SS 102	Teaching Science to English Language Learners: Walking in Their Shoes	Decolonizing STEM Education for Equity and Social Justice	Avoiding De-Natured Science: Activities and Approaches to Effective NOS Instruction	M.A.D. Teaching: Models, Analogies, and Diagrams	Utilizing Virtual Labs to Differentiate Instruction	Linking Science and Literacy
SS 109	Using STEM to protect a pet!	ZOMBIE ATTACK!	Using Argumentation as a STEM Strategy - Increasing Student Voice and Choice	The Value of Scientific Writing Scientific Explanations in STEM, Claim-Evidence-Reasoning	Demystifying STEM with a STEM Teacher Certificate	Using Current Events to Inspire your Students

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SS 111	Data-generating Simulations that Add Math and Statistics to your APES/IB ESS or AP/IB Biology Course	Biology for the Next Generation	Using Mitotic Division to Introduce Statistics in AP and IB Biology	Describing Data Using Central Tendencies, Graphs and Statistics in AP and IB	The Genomic Future? A classroom approach to implementation of NGSS heredity	Monster Babies! Genetic inheritance, evaluating adaptations, scientific explanations and art to engage diverse learners
SS 112	Bring the Spirit of Ocean Exploration to Your Classroom!	Research Presentation: An Examination of the Relationship between PD Providers' Epistemological and Nature of Science Beliefs and their PD Programs	Integrating Chromebook with Vernier Technology	Integrating iPad with Vernier Technology	Practical Applications of Climatic Events (M.Y.S.P.A.C.E.)	Your personal geography: 21st Century tools for developing your sense of place
SS 116	Feeling the Earth Move: How GPS teaches us about Cascadia earthquakes	Talking Science	G.L.I.M.P.S.E. of eCybermission	Using phenomenon found in Pacific Northwest National Parks to bring focus and relevancy to student investigations	Connecting Natural & Social Sciences	Science/Math Integration for a Sustainable Planet
SS 120	Engaging students in citizen science through WildCam Gorongosa	Springing Forward: Does Climate Change Cause Plants to Flower Earlier? Using Data Nuggets to Engage Students in Science	Advancing Coherent and Equitable Systems of Science Education	Hidden Gaps: Identifying Outcome Gaps At Different Performance Levels	Building Partnerships: Using Unconditional Positive Regard to Build Culturally Relevant Teacher-Student Teams	Integrate Sustainability into Classroom & School to Meet NGSS & STEAM
SS 121	BRIARR House: A Residential Research Opportunity		Using HHMI BioInteractive Evolution Resources to Deepen Math Skills	How Do Species Coexist?	Using Karyotypes-Modeling the Work of a Genetic Counselor	Be the Change You Want to See in Science Education
SS 122	Steps Toward Realizing the Vision of NGSS: Self-paced Online Learning to Involve All Students in Science	Project-Based Learning STEM Units Inspired by Professionals and Real World Problems	Exploring Earth & Environmental Science with GLOBE	Cloudspotting		
TCB 208	The integration of Hands-on making and STEAM experience in Taiwan: Miniature making contest	Phenomena: Moving Student Learning Forward	How to Integrate STEAM Throughout Your Day	Out on a Limb	Place-Based Education: Bringing Science to Life	Citizen Science for Your Students

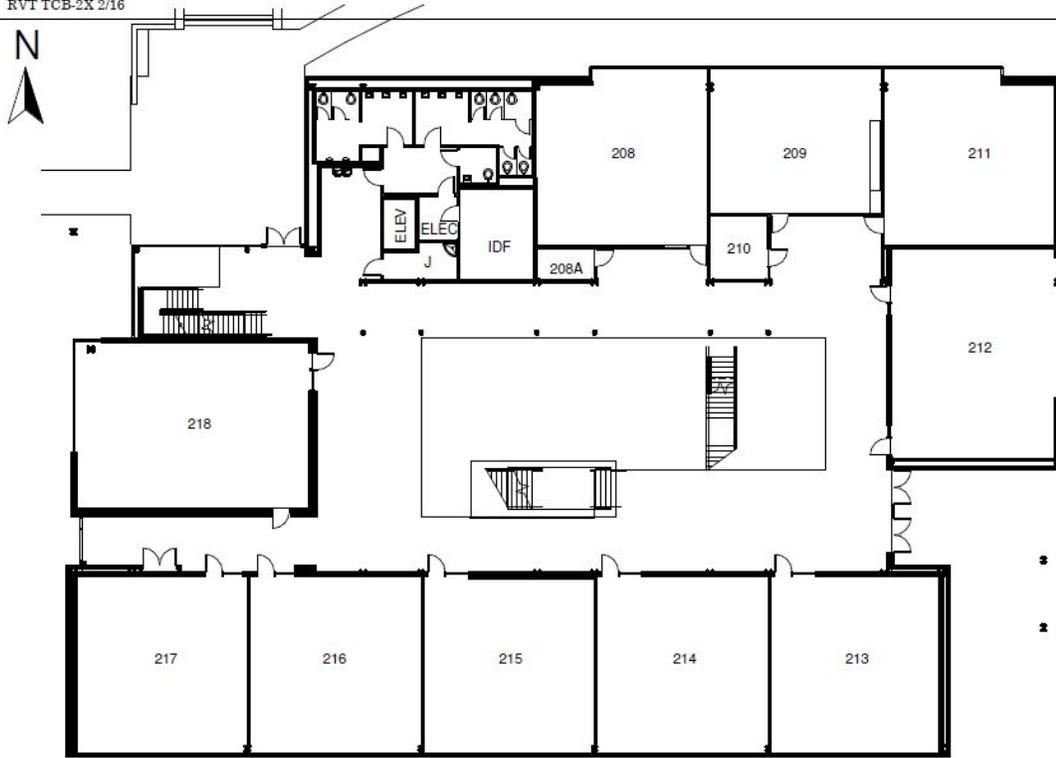
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TCB 213	The Art of Earth Science	S.M.I.L.E. (Science and Math Investigative Learning Experiences) After School Programs supporting S.T.E.M. for 30 years.	Shallow-Water Ocean Waves - A Simulation Activity	On the Sea Level - Measuring Sea Level from Space	Exploring Climate Change Curriculum	Increasing Teacher Access to NGSS PD: Building Authentic Online Communities in Real Time
TCB 216	Supporting Science Through Writing	Mindsets in STEM Classrooms	Structuring Discussion to Be Equitable and Rigorous	Making Three-Dimensional Learning Meaningful for Students using Science Story Lines	Into the Woods: Field-based Research Projects	Field-based Research - We will buy your equipment.
TCB 217	NGSS Storyline Coherence for K-2: Phenomena and Context-Based Units of Study for K-2	Can NGSS Really Be Done at the Elementary Level?: A Research Based Professional Development Model		Academic Language Fostering Student Success: The Voice of the Learners	Enhancing Learning and Teaching in STEM	Everyone Can Code
SS 204	The JGEMS Endangered Species Project: Engaging Students with Charismatic Megafauna	STEAM-powered Eco Exhibits: A student interest-driven unit	Make it Relevant. Make it Fun. Make it About Me!	It Sounds like Science!	It Looks Like Science!	
SCB 204	STEM for All: Constructing a Bridge to Equity	A Focus on Modeling in the Phenomenon-Based Classroom	The "E" in STEAM is not to be Feared	A Phenomenal Menace to the West: Exploring the Science of Aquatic Invasive Species	Using Anchoring Phenomena and Driving Question Boards to Spark Student Questioning	
SCB 205			Kid Wind - Renewable Energy Lessons and Materials: Session #1	Kid Wind - Renewable Energy Lessons and Materials: Session #2	Kid Wind - Renewable Energy Lessons and Materials: Session #3	



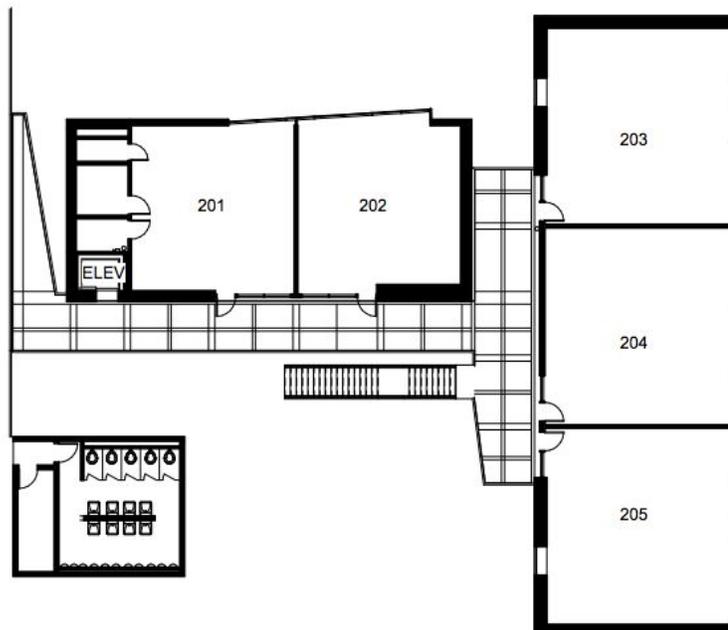
TECHNOLOGY CLASSROOM BUILDING  
SECOND LEVEL  
RVT TCB-2X 2/16

# TCB



SOUTH CLASSROOM BUILDING  
SECOND LEVEL  
RVT SCB-2X 09/17

# SCB



AM Automotive & Metals  
 BK Bookstore  
 CC Amo DeBernardis College Center  
 CT Communication Technology  
 HP Heat Plant  
 HT Health Technology  
 LIB Library  
 PAC Performing Arts Center

SCB South Classroom Building  
 SS Social Science & Technology  
 ST Science & Technology  
 TCB Technology Classroom Building  
 Safe Assembly Area

Parking Permit Stations  
 Disabled Parking  
 30 Minute Visitor Parking  
 Purchase One Day Parking Permit  
 Wireless Hotspot  
 Next Generation Wireless  
 Provides faster speeds and better reliability.

All campus locations are Tobacco Free.

