SEEd Swap Workshop

2017

7th Grade
Welcome to the 2017 SEEd Swap Teacher Workshop

It’s an exciting time for the world of science instruction; advances in cognitive and pedagogical research are reshaping the way we think about engaging students in science and engineering. The state of Utah has reflected these improvements in the new 6-8th grade SEEd (Science and Engineering Education) Standards, which will be implemented across the state during the 2017-2018 school year. While this change is exciting, it also poses significant challenges. The SEEd standards are built on Disciplinary Core Ideas, as were the previous standards. The new components include the explicit integration of Science and Engineering Practices into every single standard, and the framing of ideas within Crosscutting Concepts to allow instructors to help students organize their thoughts. These three components, called ‘dimensions,’ when anchored to instruction that allows students to explore phenomena they encounter in the world, allows students to act as sense-makers and science/engineering practitioners.

In order to provide 6-8th grade teachers with professional learning support to successfully implement the new standards, the Center for Science and Mathematics Education (CSME) is offering a week-long workshop focusing on the content that has ‘swapped,’ or is new to each grade – the “SEEd Swap.”

USBE Credit:
80% documented attendance, taken 2x daily by your instructor, as well as an accurate CACTUS ID number on record, are required to earn 3 USBE credits.

Supply Stipend
A $150 check will be issued to each attendee who
Completed the pre-assessment by the July 29th deadline
Attend 100% of the workshop
Complete the post-assessment between noon on Aug. 4 and midnight Aug. 8th.

Curricular Resources
The majority of the resources found in this book will be available online at the Center for Science and Mathematics Education website: https://csme.utah.edu/resources/k12curriculum/
Megan Black

Megan Black is an elementary science curriculum specialist in Granite School District. She taught science for twelve years working with students in grades 4 - 9, but most often 6th grade. Megan was on the 6th grade SEEd standards writing committee and has been involved with developing the 6th Grade SEEd OER textbook. She is interested in developing curriculum and instructional strategies that engage students as scientists as they explore and figure out the natural world around them.

Sarah Braden

Sarah K. Braden started her career in education as a high school biology, physics, and English as a Second Language (ESL) teacher. Dr. Braden is currently an Assistant Professor of English Language Learner education in The School of Teacher Education and Leadership at Utah State University. Her research centers on understanding language socialization phenomena and promoting equity the sciences.

Brad Carroll, Professor Emeritus - Physics, Weber State University

Brad Carroll began his career as a high school math and physics teacher in Bakersfield, California. After receiving his Ph.D. in astrophysics from the University of Colorado, Brad spent time as a postdoc at the University of Rochester before joining the Physics Dept. at Weber State University in 1985. At WSU, Brad collaborated with faculty in the Dept. of Chemistry to develop a unique physical science course for elementary education majors. He also co-authored An Introduction to Modern Astrophysics, the standard undergraduate astrophysics text. Brad retired in 2015 after 30 years at WSU, 10 of them as chair of the Physics Department. In retirement, he continues to teach with the Physics Department and Honors Program, and is working on the third edition of his astrophysics text.
Jordan Gerton, Director of CSME and Associate Professor of Physics

I received my Bachelor’s degree in Engineering Physics from the University of Arizona and my Master’s and Doctorate degrees in Physics from Rice University. I have had a number of formative experiences over the years that have stoked my passion for math and science education and have driven me to leadership roles in these areas. Math and Science are among the most important and impactful human pursuits, and I am committed to helping students of all ages and backgrounds develop a passion for and proficiency in these enabling disciplines.

Holly Godsey

Dr. Holly Godsey is the Director of Student Success and Teacher Development at the CSME and an Associate Professor (Lecturer) in the Department of Geology and Geophysics. She has a BS and PhD in Geology from the University of Utah and an MS in Oceanography (Marine Geology and Geochemistry) from the University of Michigan. Since 2004, she has been involved with several science education projects that connect faculty, graduate and undergraduate students to K-12 teachers and students to inspire, empower and educate learners from across generations and disciplines.

Maura Hanenberger

Maura Hahnenberger is an Assistant Professor in the Geosciences Department at Salt Lake Community College. At SLCC she teaches and advises in the Atmospheric Sciences and Geography programs in both face to face and online settings. Maura is the founder of the WaterGirls outreach program which provides middle school girls with field experiences conducting water science. She also serves on the boards of the SLCC Chapter of the Utah Women in Higher Education Network, Utah Chapter of the American Meteorological Society, and the Earth Science Women’s Network.

Emily Harward, 7th & 8th Grade Science & Biology Teacher at Granite Schools

Emily was lucky to grow up in the Salt Lake Valley, with opportunities to spend time exploring nature. She graduated from the University of Utah in 2004, and has been teaching science at Evergreen Junior High in Granite District ever since. For Emily, the most rewarding part of teaching is developing lessons and activities that provide a pathway for students to develop their own understanding and make sense of the world they live in.
Patrice Kurnarth

Patrice received her B.S. in Biology from Ithaca College and worked in academia for a few years at Yale University and UC Berkeley. She earned her Ph.D. in Biology from the University of Utah in 2016. During her doctoral thesis, Patrice worked with middle school science teachers in the Salt Lake valley for two years as part of a GK-12 graduate school fellowship funded by the National Science Foundation. This experience was truly transformative because she learned about pedagogical theory and experienced first-hand the set-backs and successes of teaching.

Candace Penrod, District Science Supervisor at SLC School District

Candace’s teaching career began in California in elementary education. Upon moving to Utah, she transitioned to secondary science teaching, followed by several years as instructional coach. She is currently the District Science Supervisor for Salt Lake City School District. Candace obtained a Master in Education from the University of Utah in 2009 and a Master of Science in Earth Science Teaching from the University of Utah. Candace is passionate about K-12 science education and continually seeks for opportunities to improve science teaching and student learning at all levels.

Scott Roskelley, Science Assessment Specialist at Utah State Board of Education

Scott was born and raised in Chicago, Illinois and from a young age loved science. He holds degrees in wildlife biology, marine biology, teaching and learning, and educational administration. Never expecting to work in education, Scott fell into teaching in 2001 as he entered the alternative route to licensure in Utah. Scott worked for 15 years in the Jordan School District, mostly teaching middle school. Now as the state science assessment specialist, he is responsible for working with Utah teachers to develop the new end-of-year assessment for the new SEEEd standards.

James Ruff

I am an evolutionary biologist studying basic evolutionary topics including sexual selection, and the forces maintaining genetic diversity in populations; furthermore, I apply evolutionary principles and techniques to questions concerning nutrition, toxicology, and pharmaceutical safety assessment. I am passionate about science education and prefer to focus on the process of science relative to the ‘fruits’ of the process. In this vein, I incorporate study designs, data analysis and writing into each of my courses. I have been a teaching fellow at both elementary and middle schools in SLCSD.
Heather Waite

I received my degree and teaching certificate from Weber State University in 2006 in Biology. I’ve been recently teaching 7th and 8th grade science at South Ogden Jr. High for 10 years. This summer I have taken the opportunity to write assessment pieces for the state. I have also worked on a District Level to develop assessments for test review and teacher evaluation. I am currently serving as department chair at SOJH. I also served on the School Transformation Team (Assessment to Achievement) for 2 years.

Tamara Young, Academic Advisor in the Department of Physics & Astronomy

Tamara’s interest in physics began in high school. As an undergraduate at Utah State University, Tamara’s studies focused on nuclear and particle physics. Tamara taught science and math for several years in the public education system. For the last couple years, Tamara has taught astronomy at SLCC, participated in course curriculum development with CSME, and taught a computational astronomy course for Master’s students in Physics Teaching. Tamara is the academic advisor in the Department of Physics & Astronomy at the University of Utah. She also engages in public outreach and education, and loves to talk about physics.
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## SEEd Swap Workshop 2017: 7th Grade Schedule

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<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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</thead>
<tbody>
<tr>
<td>7:30-8:30</td>
<td>Check In</td>
<td></td>
<td></td>
<td>7.2.1 and 6 part 1 Rocks/Geologic Time Scale</td>
<td>OPTIONAL: Observation Walk: How to Get Students Asking Questions Outside of the Classroom.</td>
</tr>
<tr>
<td>8:30-10:30</td>
<td>7.1.3 - Static/Electric Gravitational Fields</td>
<td>7.1.1 - Newton's 1st &amp; 2nd Law</td>
<td>7.1.4 - Magnetic &amp; Electrical Force 1</td>
<td>7.2.1 and 6 part 1 Rocks/Geologic Time Scale</td>
<td>7.2.5 - Fossils/Plate Tectonics</td>
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<tr>
<td>10:30-10:45</td>
<td>BREAK</td>
<td>BREAK</td>
<td>BREAK</td>
<td>BREAK</td>
<td>BREAK</td>
</tr>
<tr>
<td>10:45-12:00</td>
<td>Intro to 3D Instruction</td>
<td>Force and Motion 101</td>
<td>Community Resource Fair/Panel</td>
<td>What's in a Name? The interpretive Power of Rock I.D.</td>
<td>Basic Mechanisms and Common Misconceptions of Evolution</td>
</tr>
<tr>
<td>12:00-1:00</td>
<td>LUNCH: USBE with Roskelley</td>
<td>LUNCH</td>
<td>LUNCH</td>
<td>LUNCH</td>
<td>LUNCH</td>
</tr>
<tr>
<td>1:00-3:00</td>
<td>7.1.5; Relationship between mass and gravity</td>
<td>7.1.2 - Newton's 3rd law</td>
<td>7.1.4 - Magnetic &amp; Electrical Force 2</td>
<td>7.2.1 and 6 part 2 Rock Cycle/plate tectonics</td>
<td>7.5 - Evolution</td>
</tr>
</tbody>
</table>
Introductory Writing Prompt:
Your Finest Moment

Describe a classroom experience that you facilitated that allowed a student to:

- learn content
- act like a scientist
- feel empowered

How, specifically, did you structure that students’ experience to allow them to do and feel those things?
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Adult Learning Principle</th>
<th>Participant Language Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-8:45</td>
<td>Writing Activity/Discussion (in notebooks):</td>
<td>Needs Assessment</td>
<td>Written Reflection</td>
</tr>
<tr>
<td></td>
<td>• Your Finest Moment – When did you facilitate a classroom experience that</td>
<td>Ideas, Feelings, &amp; Actions</td>
<td></td>
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<tr>
<td></td>
<td>allowed a student to learn content, act like a scientist, and feel</td>
<td>Clear roles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>empowered?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:45-8:55</td>
<td>Week's overview</td>
<td>Clear roles</td>
<td>Written Questions</td>
</tr>
<tr>
<td></td>
<td>• PPT: SEEdSwap2017_Overview.pptx</td>
<td>Safety</td>
<td></td>
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<td></td>
<td></td>
<td>Sequence &amp; Reinforcement</td>
<td></td>
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<td></td>
<td></td>
<td>Respect for Learners</td>
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<tr>
<td>8:55-9:05</td>
<td>Cohort member introductions</td>
<td>Teamwork</td>
<td>Individual writing</td>
</tr>
<tr>
<td></td>
<td>1. Writing Activity (in notebooks):</td>
<td>Engagement</td>
<td>Partner Sharing</td>
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<td></td>
<td>• 4x4 matrix: best/worst PD instructors/participants</td>
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<td></td>
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<tr>
<td></td>
<td>2. Participants talk to 12 other people to find out:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• 3 answers for each quadrant</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Name</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>o District, grade</td>
<td></td>
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<tr>
<td></td>
<td>o 1 word to describe your experience of Best/Worst Instructor/Participant</td>
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<td></td>
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<tr>
<td>9:05-9:15</td>
<td>Establish Norms:</td>
<td>Safety</td>
<td>Group Discussion</td>
</tr>
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<td></td>
<td>&quot;Based on our experiences in PD, what are our norms to make this week</td>
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<tr>
<td></td>
<td>maximally impactful?</td>
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<td></td>
<td>• Start and End On Time</td>
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<tr>
<td></td>
<td>• Be present</td>
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<tr>
<td></td>
<td>• Be yourself</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• What else?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:15-10:15</td>
<td>Model Lesson #1 – Instructor Choice</td>
<td>Engagement</td>
<td>In Lesson Plan</td>
</tr>
<tr>
<td>10:15-10:30</td>
<td>1. Written reflections of model lessons</td>
<td>Praxis</td>
<td>Written Reflection</td>
</tr>
<tr>
<td></td>
<td>2. Questions from participants: sticky note collage</td>
<td>Accountability is mutual</td>
<td></td>
</tr>
<tr>
<td>10:30-10:45</td>
<td>Break</td>
<td></td>
<td></td>
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<tr>
<td>10:45-11:45</td>
<td>Direct Instruction: What is 3D science, and why am I</td>
<td>Immediacy</td>
<td>Planned partner</td>
</tr>
<tr>
<td></td>
<td>being asked to teach this way?</td>
<td>Sequence &amp; Reinforcement</td>
<td>conversation every 10</td>
</tr>
<tr>
<td></td>
<td>• SEEdSwap2017_Why_3D_Instruction.pptx</td>
<td></td>
<td>minutes</td>
</tr>
<tr>
<td>11:45-12:00</td>
<td>Written reflection (5 minutes)</td>
<td>Praxis</td>
<td>Written Reflection</td>
</tr>
<tr>
<td></td>
<td>Questions (10 Minutes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00-1:00</td>
<td>Lunch</td>
<td>Clear Roles</td>
<td>In Lesson Plan</td>
</tr>
<tr>
<td>1:00-2:00</td>
<td>Modeled Lesson # 2</td>
<td>Engagement</td>
<td></td>
</tr>
<tr>
<td>2:00-2:45</td>
<td>Talking Phenomena: Management and Equity in the 3D classroom</td>
<td>Immediacy</td>
<td>Planned partner</td>
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<tr>
<td></td>
<td></td>
<td>Sequence &amp; Reinforcement</td>
<td>conversation every 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>minutes</td>
</tr>
<tr>
<td>2:45-3:00</td>
<td>Written reflection</td>
<td>Accountability is mutual</td>
<td>Written Reflection</td>
</tr>
<tr>
<td></td>
<td>Feedback for tomorrow</td>
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</tbody>
</table>
Welcome to the 2017 SEEd Swap Teacher Workshop

The Center for Science and Mathematics Education
THE UNIVERSITY OF UTAH

Why is it called the SEEd Swap?

1. The new SEEd Standards;
   Science and Engineering Education

2. Focus on CONTENT that has “swapped,” or is new.
   *We won’t officially bring in lesson plans to trade with each other, though we will have some shared work time*

Who are we?

Participants:
6th-8th grade teachers who are motivated learners

Instructors:
Classroom teachers who are already implementing 3D instruction with their students.
### What Will We Do Each Day?

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-10:30</td>
<td>Modeled Lesson/Reflection/Planning time</td>
<td>Demonstrate and integrate 3D instruction</td>
</tr>
<tr>
<td>10:30-10:45</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:45-12:00</td>
<td>Expert Lecture Or Community Resource Panel</td>
<td>Support learning of new content through direct instruction</td>
</tr>
<tr>
<td>12:00-1:00</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>1:00-3:00</td>
<td>Modeled Lesson/Reflection/Planning time</td>
<td>Demonstrate and integrate 3D instruction</td>
</tr>
</tbody>
</table>

### This Week is Planned Intentionally

We respect that you, as adult learners, have:

- rich, real experience to bring to your learning
- The potential to learn from, as well as with, each other
- a need to connect your learning directly to your classroom practice

(Vella, 1994)

### 3 USBE Credits and $150 Supply Stipend

Both based on attendance:

- Credit
  - at least 80% participation (may miss up to one day)
  - accurate CACTUS number
- $150 Supply Stipend
  - Pre- and Post-assessment
  - 100% on-time attendance
  - W-9 form
Please fill out and turn in your W-9 forms now.

Meet your colleagues!

Learner Prompt:
1. Writing Activity (in notebooks):
   4x4 matrix: best/worst PD instructors/participants
2. Participants talk to 12 other people to find out:
   3 answers for each quadrant
   Name
   District, grade
1 word to describe your experience of Best/Worst Instructor/Participant.

Norms for the week:

Learner prompt:
In your workbook, list (2 minutes):
What norms would have addressed the worst behaviors?
What norms would have encouraged the best behaviors?
Norms for the week:

Start and End On Time

Be Present

Be Yourself

because everyone's time is valuable

because everyone is busy and important
• refrain from using devices (phones, computers) unless during instruction that doesn't require it.
• if you must, feel free to step outside for:
  • restroom
  • communication

• your experience is valuable and welcome.

What else do we need for the week to be successful?
Complete this 4x4 considering your previous professional development experiences.

<table>
<thead>
<tr>
<th>Qualities of Best Facilitators</th>
<th>Qualities of Worst Facilitators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualities of Best Participants (colleagues)</td>
<td>Qualities of Worst Participants (colleagues)</td>
</tr>
</tbody>
</table>