SDUHSD Science Newsletter
March 2017
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Cindi and Jenn will be using these updates as a communication tool each month. The newsletter archive is hosted here. Please e-mail jennifer.mccluan@sduhsd.net should you notice any colleagues not receiving it.

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2016-2017 Professional Development

Spring 2017 PD Sessions
Our middle and high school colleagues have completed the Spring 2017 professional development sessions. Links to the slide decks used during these sessions can be found here.

Content Transition Folders
Andrea Lawless created these folders (thanks, Andrea!) for each grade level/discipline to support our transition to new content in 2017-2018 and beyond. Please feel free to add resources to these documents/folders to support colleagues in our NGSS transition. I will work on adding links to the Evidence Statements for each Performance Expectation associated with new content.

Scope and Sequences
Below are links to each grade level/discipline's Scope and Sequence documents. As we discussed in our spring PD sessions, ideally these drafts should be completed this spring, but if summer time is needed, by July 31, 2017. If you notice your site's Scope and Sequence is missing from these folders, please e-mail Jenn.

- 7th Grade
- 8th Grade
- Biology
- Chemistry
- Physics

April Department Chair Meetings
Middle School Science Department Chairs will be meeting with Cindi, Jenn, and Mike Grove after school on April 26, 2017. Agenda topics for this meeting include: health topics in middle school science, identifying essential 6th grade content for our elementary feeders, and clarifying content shift expectations for 2017-2018 transition year. Several of our elementary feeder districts have reached out and asked which essential content in the 6th grade integrated model we would like for them to focus on in their NGSS transition. Cindi has shared a document for recording this input with middle school science chairs. Please speak with your department chair should you have any questions/ideas you would like shared in this document or at the 4-26 middle school science department chair meeting.

High School Science Department Chairs will be meeting with Cindi, Jenn, and Mike after school on April 27, 2017. The conversation will center on course sequence models to support the 3 year high school science

graduation requirement. Cindi, Jenn, and Mike have drafted some questions and shared them with highs science chairs to guide department discussion around the NGSS Transition Plan for high school. The plan is for high school chairs to discuss these questions with their site teams, and bring their feedback to the 4-27 high school science chair meeting.

Instructional Materials Pilots for 2017-2018

This information was emailed to science teachers on 3-29-17, and is reproduced here for your convenience:

If you are interesting in piloting NGSS instructional materials for 2017-2018, please complete this initial checklist (this is for you, and does not need to be submitted) and more detailed online survey. For reasons outlined below, we have extended the online survey deadline for all middle and high school science teachers to Friday, 4/7/17.

Several teachers (and principals) shared a concern that, given the uncertainty of teaching/course assignments for next year, it would be difficult for some colleagues to submit pilot requests when they do not yet know which grade level/course they will be teaching for 2017-2018. I spoke with Mike Grove about this concern yesterday. Given that budget decisions will need to be made before teachers will know they teaching assignments for next school, we are unfortunately unable to wait until teachers know their assignments.

As a solution for those teachers who do not yet know which courses they will teach for 2017-2018, we would ask that you still complete the online survey questions to the best of your ability. The key things we need to know for budgetary decisions are:
(1) which set of instructional materials/company you are considering (Discovery Tech, Amplify, etc.)
(2) who you would consider working with in collaboration (you can include choices depending on which classes you might teach)
(3) estimated total pilot cost (this can be a range)

For example, you may not know yet if you will be teaching 7th or 8th grade science, but you might be interested in piloting Amplify instructional materials for either course. You would research the estimated cost for the 7th grade unit you are most interested in piloting, as well as your preferred 8th grade unit, and include both in the survey. I have modified a survey question where you would have the chance to indicate you do not know what you will be teaching yet for 17-18.

We appreciate your flexibility so that we can meet the budget deadline, and want to support as many teachers as possible in piloting a wide range of instructional materials for next school year. As always, please feel free to reach out to Jenn with any questions.

NGSS Updates and Resources

CAST and CAA Science Assessment Updates from State Superintendent

In this letter from Deputy Superintendent Keric Ashley, new training resources to support the new science assessments and three dimensional instruction in science classrooms are shared from the California Department of Education. Click here for a direct link to the CDE's California Science Test resource page.

7 Things You Need to Know about NGSS This Month

A highlight for this month includes a request for submission of lessons for a database NGSS is attempting to create/curate.

NGSS Assessment: Seeing Students Learn Science (Integrating Assessment and Instruction in the Classroom)

In this National Academies Press publication, the changes to instruction and learning brought about by NGSS are explored, and concrete examples of assessments are provided. Additionally, guidance is provided around how to adapt current assessments to accompany the inherent NGSS shifts in instruction. The entire book can be downloaded for free at the link provided above.

Designing Science Inquiry: Claim + Evidence + Reasoning = Explanation
In this Edutopia article, Assistant Professor of Science Education Eric Brunsell explores how the strategy of CER (Claim, Evidence, Reasoning) can help build students' understanding of scientific explanations.

Science Learning Hub
Teacher resources including background support for teachers, as well as activities and instructions for student investigations.

Chapter 1 Will Be Re-Written
In this CSTA article, Pete A'Hearn (Palm Springs Science Specialist and CSTA Region 4 Director) discusses why the traditional Chapter 1 (scientific method and measurement) of science textbooks will need to be re-written. An interesting read, and something to consider as we continue our Scope and Sequence work. Thanks to Andrea Lawless for sharing!

Essential Lens
What it is: Essential Lens "seeks to inspire teachers to use photographs and photographic ephemera with their teaching, and provides practical methods to facilitate the use of these materials in classroom settings across disciplines." It is NGSS-aligned (and has great resources for ELA, Math, and Social Science, also). They have collections of photographs based on key topics, lessons/activities to accompany them (including teacher background to help answer common questions students might have), as well as as "How to Use This Resource" tool for teachers. (Thanks to Jocelyn Broemmelsiek for sharing!)

Some key resources from Essential Lens to highlight:

- A Closer Look (this video shows their Essential Lens methodology in practice; teachers model how to use with students and what questions to ask).
- Focus In (step-by-step scaffold to help students analyze a photograph)
- Mars, a Case Study (navigate using tabs at top)
- Water on Mars Lesson (great for SEP #1: Asking Questions)

Middle School Science

Learn Genetics
Thanks to Krista Baldwin for sharing!

PBS Electromagnetic Spectrum Unit from Unit 1 Plan
In this PBS lesson, students explore various types of electromagnetic waves. They watch a video segment and use an interactive activity that both explain the range of the spectrum and common sources of electromagnetic waves. They also view images of astronomical objects that were observed with telescopes designed to detect different forms of electromagnetic radiation. They then watch two more video segments that explain more about the physics of electromagnetic waves, including the scientific theory that couples electricity and magnetism, which is the fundamental principle behind electromagnetic radiation.

Sunrise, Sunset

Recognizing that misconceptions are perniciously difficult to overcome, the lessons presented here attempt to create instances of dissatisfaction with current thought (see Posner et al. 1982) and encourage middle school students to connect with the Sun's changing position from an Earth perspective. By making personal, Earth-bound observations, students can connect their new knowledge in a relevant and exciting way. Through fostering student observations and critical thinking, we hope to provide students with opportunities to draw conclusions from evidence that lead to deeper understanding.

High School Science

Gas Laws and the Over-Reliance on Algorithmic Thinking
In this Chemical Education Xchange article, Chemistry instructor Ben Meacham explores his students' over dependence on algorithmic thinking. Thanks to Brinn Belyea for sharing.!

Winning by a Neck: A Case Study in the Scientific Process
This interrupted case study is designed to introduce beginning biology students to the process of science by exploring a question that is accessible to students with limited scientific background. The giraffe (Giraffa camelopardialis) is the tallest terrestrial mammal and has a disproportionally long neck. Historically, this trait has been hypothesized to be an adaptation for competition between the giraffe and other herbivore species. Guided by a PowerPoint presentation and (optional) worksheet, students will propose hypotheses to explain the giraffe's uniquely long neck and will examine the results of field experiments to test the prevalent historical hypothesis that the long neck allows the giraffe to exploit high food sources. They will find that the data do not support this initial hypothesis and will use other field observations to propose and examine an alternative hypothesis. Throughout the activity students will engage in the process of science; they will propose hypotheses, design experiments, make predictions, and draw conclusions from published field observations.

Eclipses (March 2017 NSTA *Science Teacher*)
On August 21, millions of people across the continental United States will be able to experience one of the most rare and wondrous of nature's celestial events: a total eclipse of the Sun. This NSTA *Science Teacher* issue devotes three feature articles to eclipses and related phenomenon, looking at the subject from different angles. Planetary science is well worth revisiting in our high school classes, if only to give students better understanding and appreciation of the majestic Sun-Earth-Moon system we experience every day. The dramatic cover photo this month offers one view of that system. It shows the Moon moving between NASA's Solar Dynamics Observatory (SDO) and the Sun, giving the observatory a view of a partial solar eclipse from space. Several of the articles are free for non-NSTA members. Should you like to read any articles/lessons that are free for members, please e-mail Jenn (she has a membership).

Professional Learning Opportunities

Aerosummer Camps
Discover the adventures of engineering. Through imagination, strength, and creativity, engineers will tackle ways to improve on robotics, rocket propulsion, and Martian mobility. Let's get started engineering the products of the future. Aerosummer Camps begin on the week of July 17, 2017 and end the week of August 14, 2017. To see our Aerosummer schedule and to begin registration, click here.

CraftED Curriculum PD
CraftEd has teamed up with some exciting local organizations to bring to you an incredible PD opportunity. As part of the San Diego STEM Ecosystem, LEGOLAND, Ruben H Fleet Science Museum, North County Professional Development Federation and you very own, CraftEd announce the following event that we hope you can attend:

Real World Integration for Deeper Learning
A professional development experience designed to support teachers with the integration of STEM experts and field work into the 21st century classroom.

Part I: Real-World Integration PD Workshop (May 13th 8:30-10:30)
*See description below.
Followed by free admission to LEGOLAND for educator participants and discounted tickets for family members.
Part II: Educator-Industry Meet-Up (June 1st 4-6)
An informal opportunity for educators to meet (recommended) industry contacts in person, in addition to making additional industry contacts for future units/ projects.
Workshop Description

This 90 minute interactive workshop is designed to provide teachers with high quality models, concrete planning tools, teaching strategies & community connections to integrate the real-world in the classroom.

Session topics include:

-Leveraging real-world work to bring NGSS to life
-How real-world work leads to deeper learning
-When and how to incorporate experts
-How to collect data in the field
-Implementation tips and tricks from an expert educator

Deliverables:

-Teachers will walk away with planning tools
-Teachers will learn various ways to integrate experts and community connections into the classroom
-Teachers will gain concrete teaching strategies for deeper learning and NGSS integration
-Teachers will identify project/unit plans to integrate the real-world
-Representatives from SD STEM Ecosystem will be present to help teachers make community connections for their plans
-Teachers will receive collegial feedback on their ideas and plans

Visit www.craftedcurriculum.com/events to register today!

San Diego Science Education Conference
2017 SDSEC is presented by and for San Diego SCIENCE EDUCATORS AND ORGANIZATIONS, and aims to help teachers and administrators get ready for the coming changes in science education and get connected with the San Diego science education community.

Scholarship Opportunity to Attend Fall Case Study Conference

This year we are pleased to offer three (3) scholarships to our 2017 Case Study Teaching Fall Conference September 15-16, 2017, Buffalo NY, presented by the National Center for Case Study Teaching in Science. Each scholarship includes: complimentary registration, meals served at the conference that are included in the conference registration,lunch both days and dinner on Friday), and up to a $300 stipend towards travel/room-and-board expenses, which will be reimbursed after the conference, with proof of expenses. For more information on the conference including registration,lodging and the conference schedule, please visit our website at: http://sciencecases.lib.buffalo.edu/cs/training/conference/

Scholarship Opportunities: (one scholarship in each category) 1. Post-Doctoral Fellow/Graduate Student, 2. K-12 Teacher, 3. College Faculty Member at a school tied to the following documented official designations (these are federally-designated): Hispanic-Serving Institution (HSI), Historically Black College/University (HBCU), Tribal College/University (TCU), or Minority Postsecondary Institution (MPI). Please provide documentation that your school meets these criteria by way of a website link or other document.

To apply for a scholarship, please submit an email application to Carolyn Wright cwright2@buffalo.edu by 5/1/17.

Submission Guidelines: Your application must be submitted according to the following requirements: One (1) PDF, Times New Roman, 11 pt. font, 3 page maximum, with the following pdf file name: category_lastname (ex: postdoc_wright). Only one application/category per person even if you might fall under several categories. The pdf document should contain the following information in the order/line breaks listed below:

1. Last Name, First Name
2. Category (select only one category)
3. Academic Title, Department
4. Institution name
5. Institution address
6. Email address, Phone number
7. What are your goals for teaching?
8. Why do you want to attend our conference?
9. How would you apply what you learn at our conference?
10. How would you share with colleagues what you learn at our conference?
11. If you are applying as a Graduate Student award, please give your expected degree and graduation year.
12. A copy of your CV (curriculum vitae) which is a professional resume. Your CV must be part of the 3 page limit pdf submission. For our purposes, we would like to know your: relevant science/teaching work experience (including related work at a school or private industry, e.g., work experience at a lab), your education, any science/teaching professional organizations you belong to, any publications, courses taught, awards/honors, etc.

We will acknowledge receipt of your application. You will be notified of our scholarship decision around June 1st. If you happen to pay for the conference prior to receiving an award, we will reimburse you for the payment.