Next Generation Science Saturday
May 18, 2019

1-Hour NGSS Workshops

All 1-hour workshops will be held twice (in the morning the afternoon) unless otherwise noted

"NGSS Fundamental" (Morning Only)
Kelli Quan, Elk Grove Unified School District

During this workshop, you will learn the basic architecture of NGSS (how NGSS is organized around 3-dimensions, connections to Common Core, etc.) and you will be introduced to the instructional shifts necessary for NGSS implementation. This workshop is intended for people **brand new** to NGSS.

"Developing and Using Models in Science"
Rich Hedman, Sacramento Area Science Project
Having students develop models is one of the most effective ways to help them think like scientists. But what exactly does NGSS mean by a "model"? This workshop will show how modeling can give students deeper understanding of science concepts and strengthen their critical thinking skills.

"NGSS and Classroom Assessment"
Lisa Hegdahl, McCaffrey Middle School
With NGSS Implementation comes the need to reexamine how we assess our students. Explore how formative and summative assessments built into learning sequences are explicitly used to inform classroom instruction. Links to NGSS tools will be provided so you can begin to plan your own assessments.

"Parts of an NGSS Lesson – Keep it Fascinating!
Arlene Laurison and Jay Brennan, Sheldon High School
Explore different strategies that help maintain student enthusiasm and participation using NGSS lessons. This workshop will focus on engagement, communication, and guided, student-driven, investigation that enables all learners to be successful. With an emphasis on experiential learning, participants will investigate phenomena, generate driving questions, create models, and engage in argumentation.

"Engineering in the Next Generation Science Standards"
Ben Fell, Sacramento State
This presentation will provide context for the engineering design process for use in primary and secondary education toward the development of an informed population. NGSS Practices are discussed from an engineering perspective with an emphasis on contrasting science and engineering. General schemes are provided with guided break-out discussions to brainstorm how to incorporate engineering into a science-based curriculum.

"Reading, Writing, Drawing and Talking in Science"
Ingrid Salim, SASP Teacher Leader
Participants will evaluate and develop a number of tools to facilitate student sense making through different communication media, as well as to facilitate greater equality and access for all students. Participants will leave with a number of strategies that can be implemented immediately.

Morning Science Workshops

K-2nd Grade Science

"Forces – Pushes and Pulls"
Peggy Harte, Gretchen Higgins Elementary
During this workshop we will investigate what the practice of Planning and Conducting an Investigation might look like in a kindergarten classroom. Through the lens of a student we will explore our own understanding of forces and interactions while reflecting through the lens of a teacher on what that could look like in a kindergarten classroom.
NGSS: K-PS2-1

"What Can We Learn From The Biodiversity On Earth?"
Kelli Quan, Elk Grove Unified School District
Let's explore the diversity of plants and animals in the world and learn how their adaptations can inform designs to improve our agricultural practices.
NGSS: 2-LS2-2, 2-LS4-1

3rd-5th Grade Science

"Engineering While Looking Through the Energy Lens"
Julie Harr, San Juan Unified
Explore the energy cross cutting concept through a cheap and easy marble investigation and electricity exploration. Then use the scientific knowledge to solve a problem by building a energy transfer machine using the engineering design process.
NGSS: 4-PS3-2-4, 3-5-ETS1-3

Earth Science

"Global Warming to Climate Change: Changes on Earth and What We Can Do About it."
Ingrid Salim, SASP Teacher Leader
This workshop will explore the 6th grade performance expectations around what causes weather and climate, and evidence suggesting the climate is changing due to anthropogenic sources. Participants will engage in modeling ideas based on observations of phenomena and analysis of data and will have access to a lesson sequence for these topics on line. This workshop is also appropriate for earth science instructors.
NGSS: MS-ESS2-5, MS-ESS2-6

Biology/Life Science

"Biomimicry: Use nature's adaptations to design possible solutions to a local human problem"
Heather Parker, Yuba City Unified School District
Why reinvent the wheel? Biological organisms are a great resource for ideas on how to solve human problems. See how students can find possible solutions to a local human problem using biomimicry.
NGSS: MS-ESS3, HS-ESS3, ETS1.B, LS1.A, LS2.A

Physics

"Solar Notebook Charger"
Aaron Silberman, Orangevale Open
What do we do when the power is out? If we had a solar Notebook we could charge our phones, read, and see throughout the night. This project could lend itself to a school developing a portable emergency charging station.
NGSS: MS-PS3-3, HS-PS3-3, ETS1.A, ETS1.B

Chemistry

"Phase Transitions: A Sticky Topic"
Mike Payne, Los Rios Community College
Why is water a liquid at room temperature while methane is a gas at the same conditions? Why does water melt at 0 degrees C, but dry ice doesn't melt at all? Using hands-on sense making and a model based approach, we will investigate what is going on when a substance changes state. We will try to figure out why different substances have different phase-change temperatures and how these differences are related to kinetic and potential energy. As we investigate different phenomena, we will identify several misconceptions about phase change and we will analyze those misconceptions to find out their origin and how to avoid or fix them. (A rudimentary knowledge of the particle model will be assumed)
NGSS: MS-PS1-4, MS-PS3-1, MS-PS3-4, HS-PS1-3, HS-PS3-2

Afternoon Science Workshops

K-2nd Grade Science

"What Does a Seed Need?"
Corinne Lardy, Sacramento State
How did that flower end up growing out of the middle of the sidewalk? In this workshop we'll plan and conduct an investigation, as well as analyze data, to explore what things a seed needs to sprout. We'll also engage in multiple forms of formative assessment to track your students' changing ideas and explore ways that you can expand on the classic seed growing investigation to connect to your students' funds of knowledge from their cultures and everyday lives.
NGSS: K-ESS3-1, 1-LS3-1, 2-LS2-1, 2-LS4-1

3rd-5th Grade Science

"Let's Stay Together"
Nancy Ludu and Emily Lambert, Isabelle Jackson Elementary
Many species of animals increase their chances of survival because they are part of a group or pack. We will use evidence from text and videos to construct and argument that when they form groups animals are able to survive.
NGSS: 3-LS2-1

"Gotta Make Things Go but Whoa! What about our Earth?"
Barbara Woods, Galt Joint Union Elementary School District
Enter an NGSS scientific practices journey into natural resources used for energy and fuel while discovering the resulting environmental impacts (4th grade). Engage as detectives in solving an environmental mystery that reveals the interconnectedness of earth's spheres using a scientific and environmental literacy lens (5th grade). Participants will employ scientific practices and crosscutting concepts to surface disciplinary core ideas as well as relate and connect NGSS standards, Environmental Principles and Concepts, and ELA standards from one grade level to the next.
NGSS: 4-ESS3, 5-ESS2, EP&Cs

Earth Science

"Using a Phenomenon-Question-Model (PQM) to Understand Seafloor Spreading"
Amy Burke, Laguna Creek High School
Take a trip to the ocean floor to observe phenomena that encourage students to develop questions and revise their original models to explain their observations. Students will analyze and interpret data as a means to either support or refute their student-driven models about seafloor spreading.
NGSS: MS-ESS2-3, HS-ESS2-1

Biology/Life Science

"Trees and Me: Follow the Flow of Matter and Energy"
Sarah Caves and Megan White, Stonegate Elementary
How does a tree get its mass? Follow the cycle and flow of matter and energy through hands on modeling of photosynthesis and respiration, and exploration of macromolecules through digestion.
NGSS: MS-LS1-6-7, MS-LS2-3-4

Physics

"A Different Rube Goldberg Device"
Steven Ramsay, Laguna Creek High School
Using the engineering design process to make an energy transformation device. The device must meet very specific criteria to also demonstrate student understanding of energy transfers and Newton's laws. Includes conceptual and mathematical representations.
NGSS: HS-PS3-3