“NGSS Fundamental”  
Rich Hedman, Sacramento Area Science Project (SASP)  
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 and have never attended Super SIRC before (the same workshop was offered last year).

“NGSS Intermediate”  
Laura Shafer, Sacramento Area Science Project (SASP)  
In this workshop you will closely examine the NGSS science and engineering practices. In particular, you will investigate the science and engineering practices by grade level and will develop an understanding of the built-in student learning progressions. This workshop is intended for people that have already attended the Fundamental workshop (note: the same Intermediate workshop was offered last year).

“What is a Model?”  
Kelli Quan, Toby Johnson Middle School  
This workshop will look at what models are, in the context of the Next Generation Science Standards and how they can be integrated and used in the classroom.

“Building Argumentation Through Student Talk”  
Judi Kusnick, Sacramento State Geology  
NGSS requires that students construct arguments from evidence, but students need scaffolds to get from casual discussion to formal argumentation. This workshop features a set of scaffolded activities on thermal energy that leads students from talk to a formal written argument.

“Engineering with Alginate”  
Kirk Brown, San Joaquin County Office of Education  
Have you ever watched someone use molecular gastronomy techniques to make edible beads that contain various flavors? Come see how engineering with a simple polymer can lead to a myriad of applications in physical science and life science.
10:30 – 12:30 Morning Breakout Sessions

K-3rd Grade Science Series:

“Engineering, it’s Elementary!”
Robert Sherriff, Churchill Middle School
Learn how to incorporate NGSS Engineering with your science as well as common core. Understand the Engineering Design Process and be surprised by the definition of engineering technology. Have fun with actively learning how to bring out the natural engineering skills of elementary students. We will be utilizing some curriculum from an Engineering is Elementary program.

4th-6th Grade Science Series:

“Harmony of the Spheres”
Ingrid Salim, North Davis Elementary
Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. Participants in this workshop will engage in three hands-on activities to help trace the concept progression and build a mental model for how the biosphere, hydrosphere, atmosphere and geosphere interact to create varied phenomena on Earth. Participants will see how observations and experiments in early grades lead to broad conceptual models in intermediate elementary and then allow for deeper particle model development in middle school. All workshop materials will be available online.
NGSS: 5-ESS2-1

Middle & High School Workshops

Earth Science Series:

“Climate and the Interaction of Earth Systems”
Judi Kusnick, Sacramento State Geology
The climate in a region is the product of complicated interactions between ocean currents, air currents, topography and latitude. As global climate changes, we expect to see very different consequences in different regions. This workshop investigates the interaction of the ocean and the atmosphere in producing climate, and looks at possible future shifts in regional climate as the planet warms.
NGSS: MS-ESS2-6, HS-ESS2-2, HS-ESS2-4; ESS2.C, ESS2.D
Biology/Life Science Series:
“Making Sense of Processes in Plants: Same old Btb lab transformed into an exciting, practices-based learning sequence”
Libbie Coleman, McClatchy High and Jennifer Horton, Lincoln High
When students are taught about photosynthesis they often learn that plants reduce the amount of CO₂ in the atmosphere. As a result, students are often (understandably!) confused about whether or not plants do cellular respiration. In this lesson sequence, a reimagined old-standby lab forms the jumping off point for learning experiences that help students make sense of the processes that occur in plants and clear up some seeming contradictions. In addition to covering several content standards, these lessons also incorporate almost all of the eight NGSS practices.
NGSS: HS-LS1-5, HS-LS2-5, Practices 1, 2, 3, 4, 6, 7, 8

Physics/Chemistry Science Series:
“NGSS: Using Phenomena as Entry Points to Lesson Design”
Laura Shafer, Sacramento Area Science Project (SASP)
In this workshop participants will come to understand how scientific phenomena can be used to provide entry points to lesson design. The focus of this lesson will be to apply scientific principles and evidence to provide an explanation about the effects of changing temperature or concentration of reacting particles on the rate of the reaction. The goal is to engage students in reasoning that focuses on the number and energy of collisions between molecules. Emphasis will include writing strategies for their explanations.
NGSS: MS-PS2-3, HS-PS2-5
1:30 – 3:30 Afternoon Science Breakout Sessions

K-3rd Grade Science Series:

“Change is Everywhere...Let’s Explore”
*Katy Green, Vanden High and Megan White, Stonegate Elementary*

Use cooperative talking and learning strategies that apply to all grades within the context of 2nd grade NGSS standards. Build a model of changes throughout Earth and compare the rate of change. Are they fast changes or slow changes?

NGSS: 2-ESS1-1

4th-6th Grade Science Series:

“Energy and Motion”
*Kathy Gill, Willett Elementary*

Explore the physical science topics relating speed and energy, energy transfers, and changes of energy when objects collide. In this NGSS aligned series of lessons, participants will experience a wide range of activities relating to energy. In addition, you will participate in activities designed to help the learner make sense of the science.

NGSS: 4-PS3

Middle & High School Workshops

Earth Science Series:

“Making Sense of Solar and Stellar Phenomena”
*Rich Hedman, Sacramento Area Science Project*

Participants examine solar phenomena. Patterns in the data are noticed and questions are generated. Participants develop initial conceptual models of the sun. The predictions of these models are closely examined, and new information is provided to see which models are still plausible. Through this process a model of solar phenomena is developed which achieves the NGSS performance expectation. We then examine data on stars beyond the sun to extend our model.

NGSS: HS-ESS1-1

Biology/Life Science Series:

“Guppies of Trinidad... Something Fishy is Going On: Working with student ideas around natural selection and sexual selection.”
*Chris Griesemer, UC Davis*

This workshop will introduce a scenario of differential selection among guppy populations of the same species in Trinidad. We will employ a model-based reasoning framework to explore this system and will ask: How can students work to make sense of complex patterns in the classroom?
Physics/Chemistry Science Series:

“Place your bets! Guessing, Predicting, and NGSS”
Scott Richardson, Davis Senior High

Do good scientists every guess? What is the difference between a guess, a prediction, and a reasoned answer? This workshop will explore ways in which all of these—even guesses—might be able to help our classrooms become a richer environment for scientific thinking and learning as envisioned in NGSS.
3:40 – 4:40 NGSS Workshops

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“Examining the Middle School Options”  
Rich Hedman, Sacramento Area Science Project (SASP)  
In California, districts can decide between an NGSS integrated course sequence or a discipline-specific course sequence for middle school science, grades 6-8. Examine and strive to coherently organize the performance expectations (and disciplinary core ideas) for each course sequence to help you decide which option is best for the students in your district.

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