NGSS NOW

8 things you need to know about the NGSS this month

February 2017

1 Professional Development for Science Assessment

To support educators during their development of new, three-dimensional formative assessments aligned to the NGSS, open educational resources (OER) have been developed as part of a new collaboration called the Advancing Coherent and Equitable Systems of Science Education (ACESSE, or "access") project.

The ACESSE project is a partnership between the Council of State Science Supervisors, Colorado Boulder University, and the University of Washington. The group has created two hour-long, web-based professional development sessions which include:

> **Introduction to Formative Assessment to Support Equitable Three-Dimensional Instruction** This session is intended to introduce educators to what 3D formative assessment looks like and how equity and social justice goals relate to formative assessment.
>
> **How to Assess Three-Dimensional Learning in the Classroom: Building Tasks that Work** This session provides an opportunity for educators to begin analyzing, building, and adapting more equitable 3D formative assessments.

The partner organizations encourage educators to both share the resources with their networks, including in a smaller professional learning community, and customize the resources to suit individual school or district needs. More information is available on the STEM Teaching Tools website and the OER Commons platform.

2 REMINDER: Submit Lessons and Units by March 31st!

In an effort to identify and shine a spotlight on emerging high-quality lesson and unit plans designed for the NGSS, Achieve has launched and is facilitating an **EQuIP Peer Review Panel for Science**. The objective of the peer review panel is not to endorse a particular curriculum, product, or template, rather to identify lessons and units that best illustrate the cognitive demands of the NGSS as introduced in *A Framework for K-12 Science Education*.

If you or your state, district, school, or organization has designed NGSS-aligned lessons or units,

please consider submitting no later than March 31st to ensure that the instructional materials are reviewed before the start of the 2017-2018 school year.

For more details and submission guidelines, click here.

3 Featured Standards

This issue of NGSS Now features an example of how certain PEs* could be bundled in order to develop an instructional unit that engages students in science phenomena.

MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.*

*The performance expectation (PE) marked with an asterisk integrates traditional science content with engineering through a Practice or Disciplinary Core Idea.

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For a more in-depth look at these NGSS PEs and to search for others, read this.

Need more context?

See where these ideas are introduced in A Framework for K-12 Science Education (pages 145, 150, and 194).

4 Science Phenomenon

This phenomenon offers teachers a potential way to connect our "Featured Standards" (see #3) to a real-world phenomenon:

This tree's root system grew horizontally to match the sidewalk's pattern.

Below are some high-level lines of student inquiry that could help students facilitate their understanding of DCIs related to the featured science phenomenon:

- Did the root system grow this way because of environmental or genetic reasons? What are some examples of traits caused by genetic factors? Environmental factors?
- What do you know about the ground the tree sits on? How might the roots have grown differently if the ground had different qualities?
- What design changes could you make to this sidewalk so that the tree roots could access water more effectively? How do the traits of trees (e.g., number, height, circumference) in urban areas differ from those in rural areas?

5 QUESTION OF THE MONTH

Q: ***In the new NGSS Example Bundle documents, it looks like the recommended order of courses for the high school domains model courses is as follows: Chemistry first, then Physics, and then Biology. Is that correct?***

A: The NGSS Example Bundles offer just some of the many different ways to arrange and bundle standards, and are not necessarily the recommended way to arrange courses. In one of the example high school course models, the Example Bundle writers described courses that are ordered as 1) Chemistry, 2) Physics, and 3) Life Sciences. Earth Sciences PEs are integrated into each of these courses, and increase in cognitive complexity through the courses such that the most complex ideas are those integrated into the life sciences course.

If you would like to have your question featured in a future edition of the *NGSS Now* newsletter, please contact ngss@achieve.org.

6 Report: Innovative Science Instruction Boosts Academic Performance Among English Learners

By Carolyn Jones
EdSource
January 17, 2017

English learners can dramatically improve their science skills when teachers blend science lessons with language instruction, according to a new report released by an Oakland, CA based education nonprofit.

The report identified six school districts with innovative science programs and found that English learners scored close to, or in some cases even exceeded, their English-proficient peers on standardized science tests. In some cases, they scored three times as high as English learners at schools where science is taught very little, not at all, or in ways that are difficult for non-English speakers to follow.

"You don't have to wait until a kid is fluent in English to teach them science," said Sarah Feldman, coauthor of the report along with Veronica Flores Malagon. "If you weave together science and language, kids can learn it now and in fact do very well. That's pretty amazing." Read more.

7 Talking to Children about STEM Fields Boosts Test Scores and Career Interests

By Mark Peters
UChicagoNews
January 17, 2017

A new study finds that parents who talk with their high schoolers about the relevance of science and math can increase competency and career interest in the fields. Researchers focused broadly on what's known as expectancy-value theory, and more specifically, on the concept that individuals make choices depending on the relevance or usefulness to a current or future goal.

"Parents are potentially an untapped resource for helping to improve the STEM motivation and preparation of students," said Christopher S. Rozek, lead author of the research. "We could move the needle by just encouraging parents to have these conversations about the relevance of math and science."

For the study, researchers designed materials that help parents talk to their children about the relevance of STEM fields, pointing to the role of math and science in how cell phones work or how the subjects factor into specific careers. Parents participating in a decades-long study in Wisconsin were split into two groups, with one group given the materials while the other served as the control. Researchers then tracked a variety of outcomes over several years to assess the effects. Read more.

8 The Hidden Story of NASA's Black Female Scientists

By Elizabeth Howell
Space.com
January 23, 2017

Beginning in 1935, the National Advisory Committee for Aeronautics (NACA), a precursor of NASA, hired hundreds of women as computers. The job title designated someone who performed mathematical equations and calculations by hand, according a NASA history. The computers worked at the Langley Memorial Aeronautical Laboratory in Virginia.

Human computers were not a new concept. In the late 19th and early 20th centuries, female "computers" at Harvard University analyzed star photos to learn more about their basic properties. These women made discoveries that are still fundamental to astronomy today. Read more.

NEXT GENERATION SCIENCE STANDARDS
For States, By States