

NGSS NOW

11 things you need to know about the NGSS this month (and a Science fact)

April 2015

Resource Updates

1 Achieve and Teaching Channel collaborated to produce four videos that present an [overview](#) of the key innovations in the Next Generation Science Standards (NGSS) and a deeper dive into each of the NGSS' three dimensions ([Science and Engineering Practices](#), [Crosscutting Concepts](#), and [Disciplinary Core Ideas](#)).



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2 Curious about how science education will change with the NGSS? Check out this [chart](#) from the National Research Council's free downloadable report, [Guide to Implementing the Next Generation Science Standards](#).

| How will science education change with NGSS? Implications of the Vision of the Framework for K-12 Science Education and the Next Generation Science Standards | |
|---|---|
| SCIENCE EDUCATION WILL INVOLVE LESS | SCIENCE EDUCATION WILL INVOLVE MORE |
| Wide dissemination of facts and terminology | Facts and terminology learned as needed when developing explanations and engaging students support the understanding arguments and reasoning |
| Learning of facts disconnected from questions about phenomena | Systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned |
| Teachers providing information to the whole class | Students conducting investigations, solving problems, and engaging in discussions with teacher guidance |
| Teachers posing questions with only one right answer | Students discussing open-ended questions that focus on the strength of the evidence used to generate claims |
| Students reading textbooks and answering questions at the end of the chapter | Students reading multiple sources, including science related magazine and journal articles and web-based resources, producing concise summaries of information |
| Predefined outcome for "cookbook" laboratories or hands-on activities | Multiple investigations chosen by students to explore with a range of possible outcomes that collectively lead to a deep understanding of established core scientific ideas |
| Workbooks | Student writing of journals, reports, posters, and media presentations that explain and argue |
| Overemphasis of activities for students who are perceived to be less able in science and engineering | Provision of supports so that all students can engage in science and engineering practices |

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3 Standard of the Month

[MS-ESS1-2](#): Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. For a more in-depth look at this NGSS performance expectation and to search for others read more [here](#). Need more context? See where these ideas are introduced in [A Framework for K-12 Science Education](#) (page 175).

4 QUESTION OF THE MONTH

Q: Some of my colleagues have just started to explore the NGSS. What are your recommendations for introducing them to the promise of these new standards?

A: Many resources are available that can potentially give you a good start. First, you'll get a good overview by reading the executive summary (pages 1-4) of the [Framework for K-12 Science Education](#), upon which the NGSS is based. Then, you might consider reading [this introductory document](#) about how to read the standards and look at this related [overview from the National Science Teachers Association](#).

Also, other teachers who are already using the NGSS can be a valuable resource. A great place to ask questions is through the teacher-created #NGSSChats on Twitter.

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5 Highlighted Resource

Watch [NSTA TV 2015 videos](#) to see highlights from the recent National Science Teachers Association conference in Chicago, including [this interview](#) with Dr. Okhee Lee. Dr. Lee, who previously served on the NGSS Writing Team, discusses her work with the standards and shares ways to ensure a quality science education for diverse groups of students.

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6 Congratulations!

Congratulations to all of the winners of the 2015 NSTA teacher awards, including two of the NGSS writers! Kenneth Huff received NSTA's Robert E. Yager Foundation Excellence in Teaching Award and Chris Embry Mohr received the DuPont Pioneer Excellence in Agricultural Science Education Award.



7 Key Message for the Science Education Community

The Science and Engineering Practices in the NGSS (often called "practices") are not meant to be used interchangeably with the word "skills" (often interpreted as mastery of an activity or procedure). As stated in the chapter on practices in the Framework, "This chapter stresses the importance of developing students' knowledge of how science and engineering achieve their ends while also strengthening their competency with related practices... We use the term 'practices,' instead of a term such as 'skills,' to stress that engaging in scientific inquiry requires coordination both of knowledge and skill simultaneously." (pg. 41).

This point is best illustrated by an example: think about a student who is developing and using models (an NGSS science and engineering practice). In order to do this effectively, students need to:

- Have a grade-appropriate understanding of what modeling is and how models are developed and used (the necessary knowledge), and
- Actually create and use the model (often seen as the "skill").

It is when both students' knowledge and skills come together that they can successfully engage in the science and engineering practices in the NGSS.



**SCIENCE
FUN FACT**

Pluto hasn't completed a single [orbit of the sun](#) since the Declaration of Independence was signed. In contrast, Mercury completes an orbit of the sun once every 88 days.

NGSS in the News

8

[New K-12 Science Standards Emphasize Hands-On Learning](#)

by Sanden Totten, *Southern California Public Radio*
March 26, 2015

"In 2013, the California State Board of Education approved new science standards for K through 12 classes. They're called the Next Generation Science Standards and put a stronger emphasis on actually doing science rather than just memorizing facts."



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9

[West Milford schools set sights on new science standards](#)

by David M. Zimmer, *NorthJersey.com*
March 29, 2015

"With new state science standards on the horizon for 2017, the local school district is preparing to place a new emphasis on teaching both content and skills." "It's not what you know. It's what you can do with that knowledge," West Milford's K-12 Supervisor of Science Eric Siegal said."



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Opinion

10

[New Nevada needs STEM education](#)

by Mark Newburn, *Reno Gazette-Journal*
March 5, 2015

"Governor Sandoval recently painted his vision of a new Nevada transformed by technology. Public education has a major role to play to build the workforce we need, as outlined by a Brookings Institution report, "Cracking the Code on STEM: A People Strategy for Nevada's Economy." In order to build a globally competitive workforce, Nevada will have to make significant changes to teaching practices."



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11

[Planning Investigations in 7th Grade](#)

by David Grossman, *ngssky.weebly.com*
March 8, 2015

"This week, we began our work with thermal energy in 7th grade. A big part of this unit includes developing a deeper understanding of the connections among mass, matter, heat, and thermal energy. Another big part of this unit involves the practice of planning and carrying out investigations."



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