


NGSS NOW

10 things you need to know about the NGSS this month (and a  science fact)

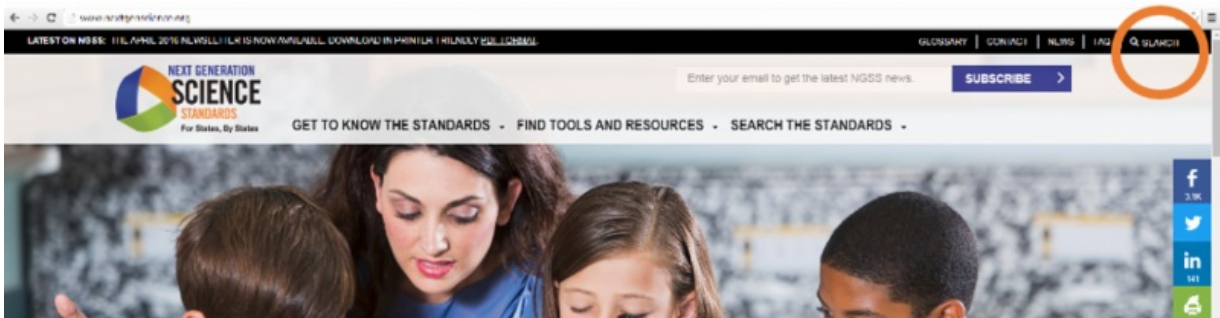


May 2016

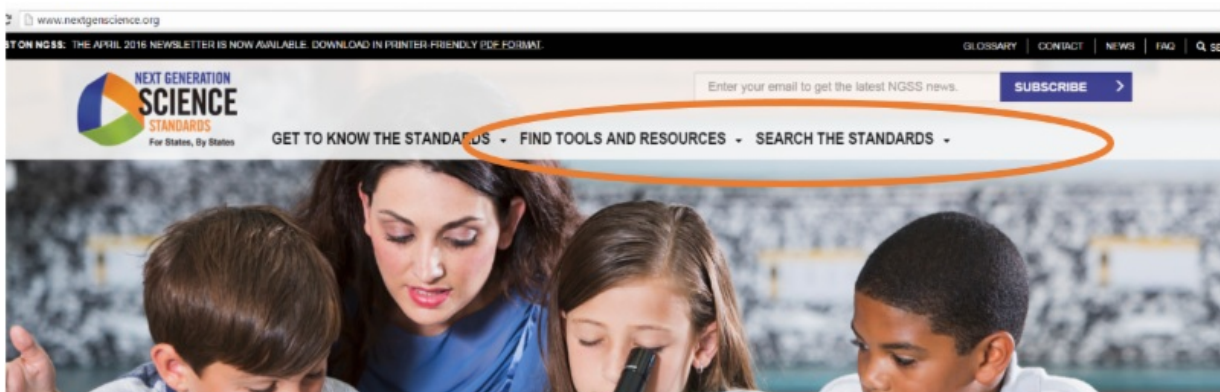
1 Important Features of the NGSS

The Appendices and Evidence Statements can both support understanding of the NGSS. How can NGSS educators and advocates find these resources on [the new website](#)?

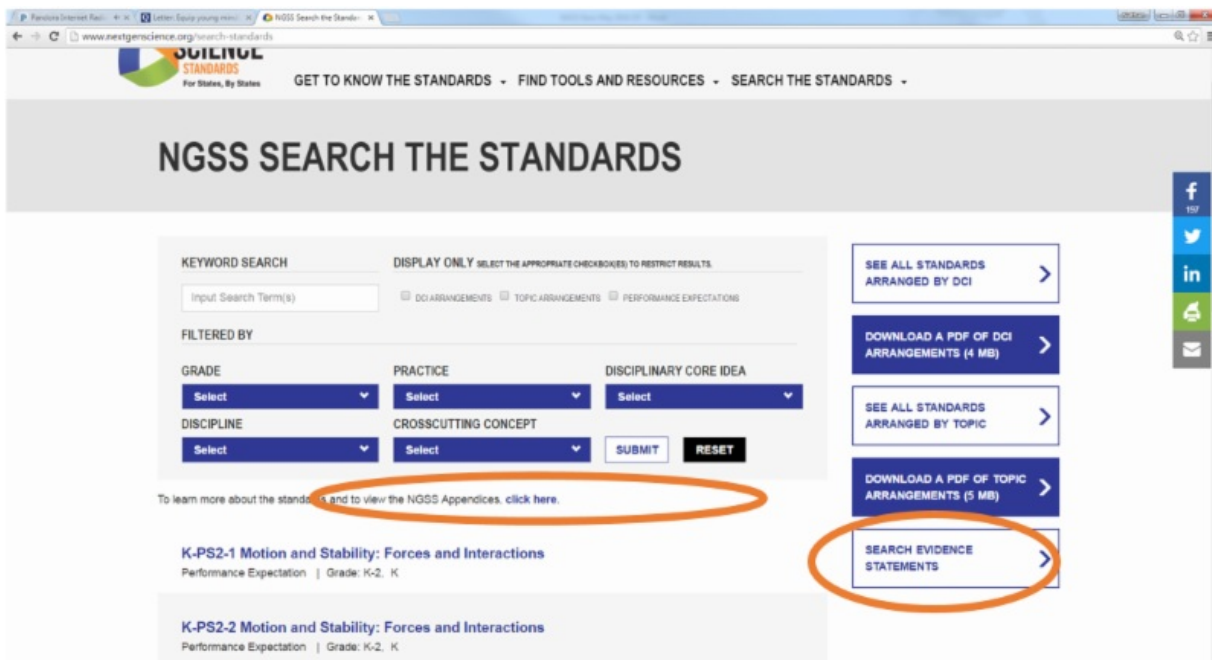
Option 1: Use a keyword search, as shown in the image below.



Option 2: Explore the drop-down menus in the top toolbar, as shown in the image below.



Option 3: Visit the "Search the Standards" section of the website, as shown in the image below.



2 Bundling Standards

The concept of "bundling" NGSS performance expectations (PEs) has been presented in a Question of the Month in [past issues](#) of NGSS Now. This month features an example of how how High School PEs* could be bundled in order to develop an instructional unit that engages students in science phenomena.

[HS-PS1-2](#) Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and

3 Science Phenomenon

A soldier opens the flameless heater of a military ration, removes a small plastic card, fills the pouch of the heater with water, and reinserts the card. The water warms, and then begins to bubble and steam. Eventually it boils. Finally, the boiling stops and the water begins to cool.



([U.S. Department of Defense](#))

The [flameless heater](#) used in military rations contains magnesium, iron, and table salt (sodium chloride). When water is

knowledge of the patterns of chemical properties.

[HS-PS1-4](#) Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

[HS-PS3-4](#) Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).

As Network States implement the NGSS, teachers, principals, and district leaders might consider the questions below when discussing how to align instruction to the standards:

- a. What type of lessons can teachers develop to help students build toward this bundle of PEs?
- b. How could a classroom discussion about this month's "Science Phenomenon" (see right) help engage students around this bundle of PEs?

**For a more in-depth look at these NGSS PEs 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](#) (pages [106](#), [109](#), [124](#), and*

added to these materials a number of chemical reactions occur. During those reactions, the atoms that make up certain molecules in the solution are broken up and rearranged to form different molecules. The new molecules have less energy than the original molecules did, so some of the stored energy was released - and as a result the temperature of the solution went up.

One of the shifts in the NGSS is to focus instruction on engaging students with meaningful phenomena that can be explained through the application of SEPs, CCCs, and DCIs.

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

- Why does the reaction stop after a given amount of time?
- What is happening to the materials in the flameless heater that causes the water to heat up?
- Will the reaction occur again if new water is added to the heater?

To see some additional ways that educators are engaging students with phenomena, go [here](#) and [here](#).



4

QUESTION
OF THE MONTH



Q: I've noticed that the same Engineering DCIs appear in the foundation boxes of science PEs such as [2-ESS2-1](#) (which contains EST1.C), and they also appear as part of their own engineering PEs, such as [K-2-ETS1-3](#).

Does this mean I need to address both standards in my teaching, even if K-2-ETS1-3 is part of 2-ESS2-1?

A: Yes, your teaching should support students in meeting both standards. Some of the NGSS Performance Expectations (PEs) integrate science and engineering design, as was done in 2-ESS2-1. However, the PEs with "ETS" in their name were written to ensure that teachers could choose additional science contexts with which to integrate Engineering Design core ideas. In the classroom instruction toward K-2-ETS1-3 would also lead toward one or more science PEs other than 2-ESS2-1.



SCIENCE
FUN FACT

Birds have a number of mental skills that [match those of primates](#).

"[These skills include] solving problems, crafting tools, planning ahead for future events, even considering another being's state of mind." (Scientific American)



5 NGSS in Educator Blogs

[Models and NGSS](#)

by Patricia Gustin, *Corelaborate*

February 15, 2016

A resource describing one teacher's experience in helping students to develop and use models.

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NGSS in the News

6

[Equip young minds with science](#)

by Jody L Still Herbold, *The Quad-City Times*
April 26, 2016

"The new Iowa Science Standards set the bar high and will help prepare our students to be scientifically literate citizens with critical thinking and problem-solving skills

7

[The three Rs and and S](#)

by S. James Gates Jr. and Norman Augustine, *The Baltimore Sun*
April 6, 2016

"While the three Rs of reading, 'riting and 'rithmetic are certainly foundational subjects for Maryland students, there is an important letter missing - an 'S' for science.

8

[New science standards in N.J. is a giant leap for education](#)

by Brian Carey, *The N.J. Star Ledger*
April 7, 2016

"Some of these changes may seem scary at first, particularly given that trial and error - making mistakes and getting the answer wrong - is a critical

ready to lead and innovate in Iowa's talented workforce. Isn't that what we want for our state and all of our children?"

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"The science class of our youth too often involved memorizing facts or following instructions straight out of a lab manual. But that isn't the cool part of science - the part that sparks imagination. The new standards help students understand how the world works."

part of learning and practicing science in the real world. If, and when, students face challenges, they need to be reminded that it's through these challenges that real learning happens. That is why engaging parents, and asking for their support, is so critical for educators."

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[Barrington students learn same concepts in different way](#)

By Gilbert R. Boucher II, *Daily Herald*
March 14, 2016

"Q: High school classes seem much more advanced, more like college courses, than they were 20 years ago. How has the teaching of your subjects evolved and how are you able to teach these advanced topics in high school?"

"A: Over the last few years, I have adopted the Next Generation Science Standards in my classes.

As a result, as I approach each new standard, I think of ways in which my students can be biologists. I push my students to think, question, analyze, develop models, and experiment like a biologist would. One might say that the content seems more advanced, but my students are still learning much of the same material as years past."

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10

[District 58 outlines Next Generation Science Standards](#)

by Bugle Staff, *Bugle Newspapers*
March 22, 2016

"The newly-formed District Science Collaborative comprises a consortium of several Illinois school districts that gathered to network and brainstorm effective roll-out strategies for NGSS curriculum and professional development. The combined group represented 26 school districts, more than 1,000 schools and more than 600,000 students.

"Eighth grade teachers are blending traditional and NGSS content, and district officials plan to expand eighth grade science content to fully align to the new standards, as well as review middle school science lab facilities for possible updates. At the elementary level, teams are preparing units of study and professional development to prepare for a future district-wide implementation of the new standards."

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