

What is NGSS and why should I care?

By Scott King, NATS Treasurer

Note: This is the first in a weekly series of articles addressing NGSS, Nebraska's science standards, and implementation in the classroom.

You have no doubt heard about the Next Generation Science Standards, or NGSS. And if you are like most science teachers in Nebraska, NGSS probably hasn't made a major impact in your classroom. But that is about to change. Nebraska is in the process of adopting new science standards based on the findings presented in the National Research Council's "A Framework for K-12 Science Education" (2012). NGSS was developed using the "Framework" and is a national model for "Three Dimensional Learning". Nebraska is not adopting NGSS, but our new standards were based on the Framework document and will be three dimensional. Because of this, you will see similarities between NGSS and Nebraska's new science standards. Since NGSS is the national model, as you begin gathering information, most of the research and articles you find will focus on it. This article will do the same.

The standards known as NGSS were released in 2013 as a collaboration between the National Research Council, National Science Teachers Association, American Association for the Advancement of Science (AAAS), and Achieve, Inc. While NGSS was based on the Framework, this document stood on the shoulders of previous research describing the major ideas for K-12 science education. Some of these documents, "Science for All Americans" and "Benchmarks for Science Literacy", were released by AAAS back in 1993. Long story short: NGSS has over 24 years of research and implementation guiding its development.

During the development process, all 50 states and thousands of stakeholders across the nation were invited to provide input into NGSS. Of those, 26 states committed to be "Lead-States" and implement the NGSS standards as their new state science standards. To date, 19 states have officially adopted NGSS. Twenty-one more have already adopted standards based on the Framework. More states, like Nebraska, are in the process of adopting Framework-inspired standards.

By state law, Nebraska is to evaluate and write new standards every seven years. As the last statewide science standards were released in 2010, we are due for new standards this year. A committee of over 50 K-12 science teachers, instructors from higher education, NATS, NDE, community science educators, and members representing industry met over four months to write the draft of the Nebraska standards. Members of this committee stretched across the state from Bridgeport to South Sioux City and every size of school from Class A to D.

The writing portion of the process has been completed. The process continues with refining the language, producing documentation, public comment, and final approval by the State Board of Education.

Like most standards developed in the past, NGSS does provide a list of topics to teach. For example: energy, motion, and cellular development are still listed as standards. But, NGSS does take it a step further to add “Three Dimensional Learning” to the mix.

Three Dimensional Learning requires you to look at each standard as a Performance Expectation (PE), or an item each student should be able to *DO*, not just content they should *KNOW*. The PE's combine a *Science and Engineering Practice* (SEP), a *Crosscutting Concept* (CCC) which links the lesson to other ideas in science, with a *Disciplinary Core Idea* (DCI) or broad science idea to study. Tying these three parts together encourages students to see science as alive and to see the connections to their world.

NATS strongly supports the new Nebraska science standards. Studies from Lead-States show strong gains in student engineering abilities and significant changes in student attitudes towards science education.

One last thing I want to mention: NGSS, and the document Nebraska will adopt, is a set of standards. It is NOT a curriculum. It provides a list of basic ideas students should understand at each point in their education. As teachers, we still have to provide information on cell division, motion, energy, and even earth processes. As the teacher, it is still up to you to determine what lessons will be provided to the students so they can meet those standards. Do you have a favorite lab activity? Great! You might have to tweak it, but you can still use it under the new standards. Do you love caterpillars and butterflies? No problem. Adjust your lesson plans to incorporate science and engineering practices and crosscutting concepts, and continue to use them.

Over the next couple weeks, NATS will be releasing more articles describing NGSS and how to implement lessons using NGSS in your classroom. If you have a question about Nebraska's new science standards or NGSS, if you are willing to be an “expert” to help others, or if you would like to submit an article addressing implementation of NGSS in your classroom, email NATS at nebacad@unl.edu