National Science Teachers Association
Frequently Asked Questions on
Next Generation Science Standards

The National Science Teachers Association (NSTA) supports the Next Generation Science Standards (NGSS) and encourages states to adopt and begin implementing them in classrooms across the country. NSTA has compiled the following frequently asked questions to help science educators understand more about this important effort. Additional information and resources can be found at www.nsta.org/ngss.

Q: What are science standards?
Broadly, science standards provide the foundation of what scientifically literate students need to know, understand, and be able to do at different grade levels.

Q. Why do we need new science standards?
If the United States is to compete and lead in the global economy, and if students are to be able to pursue employment opportunities in the rapidly growing STEM fields, all students must all have access to a quality K–12 science education. The Next Generation Science Standards that will be consistent from state-to-state have the power to transform science education and give all students—from California to Maine—the skills and knowledge they need to be informed citizens, college ready, and prepared for STEM careers.

It has been more than 15 years since science standards were first introduced. Since then, major advances have been made in science and in our understanding of how students learn science. The time is right for new science standards that all states can support and implement.

Q: What is the Next Generation Science Standards effort and who is involved?
With funding from the Carnegie Corporation of New York, the National Research Council (NRC), NSTA, the American Association for the Advancement of Science, and Achieve began working in 2009 on a two-step process to develop Next Generation Science Standards. The first step was getting the science right. Scientists from the NRC, the staff arm of the National Academy of Sciences, first developed the Framework for K–12 Science Education (www.nap.edu; or http://sites.nationalacademies.org/dbasse/bose/framework_k12_science/). The Framework was a critical first step because it is grounded in current research on science and science learning and identifies the science all K–12 students should know.
The second step was developing K–12 standards based on the Framework. In a process managed by Achieve, 26 states led the process and worked collaboratively with a 41-member writing team—many of them teachers—and with stakeholders in science, science education, higher education, and industry, including NSTA. Additional review and guidance was provided by advisory committees composed of leaders in science and science education as well as business and industry, and all science education stakeholders were invited to review and comment on two public drafts.

The standards are rich in content and practice and arranged in a coherent manner across disciplines and grades to provide all students an internationally benchmarked science education. The NGSS will be based on the Framework and will help to prepare students for college and careers. For information about the NGSS and the development process, see www.nextgenscience.org.

Q: What do new science standards mean for science education in this country?
The Next Generation Science Standards have the potential to significantly improve science education by establishing educational goals for all students in science that will prepare them to enter college or the STEM workforce and to be informed citizens. This can only happen if states adopt the standards. We encourage them to do so; there is broad public support for all states to have the same standards in science so all students everywhere will have the same access to quality science education.

Q: How is NGSS different from past standards efforts?
One major difference between the NGSS and previous standards efforts is the development process. Twenty-six states led the development of the NGSS (http://www.nextgenscience.org/states-0). This is an impressive number of states that chose to be a central part of the standards development process and pledged to give serious consideration to adopting them.

The second major difference is in the NGSS content and structure. The NGSS changes the way science is taught by integrating science practices into disciplinary core ideas and crosscutting concepts in a way that fosters deep understanding of science and technology. This represents the interconnected nature of science as it is practiced and experienced in the real world. The NGSS also emphasizes building science concepts coherently from kindergarten through 12th grade, and integrates engineering with science.

It’s important to note that the standards include student performance expectations. This is intended to help the development of assessments that integrate practices, content, and crosscutting concepts.
**Q: What role did NSTA play in the NGSS development?**
NSTA was a committed partner in the process of developing the NGSS. NSTA provided advice to Achieve and reviewed numerous drafts. We engaged groups of science educators to review these drafts and provide input, and we assembled an expert standards review team to support our efforts in making recommendations to Achieve. Many of the NGSS writers are NSTA members.

NSTA also worked to disseminate information about the NGSS, engage science educators in the feedback process, and help teachers learn more about the content and implications of both the Framework and the NGSS.

**Q: What role did classroom teachers play in the development of the NGSS?**
Science teachers played a central role in the development of the NGSS? Nearly half of the 41-member writing team members were current K–12 teachers from every level. You can learn more about these individuals at [www.nextgenscience.org](http://www.nextgenscience.org). NSTA also engaged hundreds of science educators in reviewing drafts and providing recommendations to the writers and lead states.

**Q: What happens next? How will the NGSS be implemented in schools and districts across the country?**
There are a number of pathways for teachers, schools, districts, and states to begin embracing these new standards. First and foremost, states are encouraged to adopt the standards and commit the resources and support structures—such as professional development for teachers, curricular materials, and assessments—that will be needed to effectively implement the standards. Each state will go through its own process to determine whether they will adopt the Next Generation Science Standards. This process can include the involvement of key stakeholders at the district and state levels, such as the state board of education, the state legislature, and/or the governor. Other considerations include how to integrate the standards with existing efforts around Common Core State Standards in English language arts and mathematics and other education policies and activities, and what timeline and strategy will be used.

**Q: How long will it take for the NGSS to reach my classroom?**
It is likely that some states will begin the adoption process soon after the NGSS is released. We estimate, however, that it would be three or more years before the necessary supports and funding are in place and any teachers and schools will be expected to teach using the new standards. It’s important to note that if, how, and when states adopt the NGSS and what kinds of professional development and other forms of support they plan provide for science educators will vary significantly from state-to-state.
Q: I am a classroom teacher. What do I do now? Do I need to wait for my state to adopt the NGSS?
NSTA encourages teachers, administrators, and district leaders work together and coordinate with state leaders about plans for implementation. NSTA recommends that teachers and leaders first explore the NGSS and the Framework to learn more about the vision, goals, and key concepts then form school and district teams to study them more deeply. These teams can consider instructional strategies for teaching the standards, seek out or support the development of instructional materials that will be needed, and plan long-term professional development for teachers. We also encourage teachers and leaders to advocate for the NGSS and encourage states to adopt them.

Q: I don’t think my state will adopt NGSS, what can I do?
Even if your state does not adopt, the NGSS represents good practices in science education and should be embraced by all science educators. Studying the standards (such as the scientific and engineering practices) can help you improve your teaching and learning regardless of when (or even whether) your state adopts the NGSS.

Q: My state already has state standards. Do I follow my state standards or the NGSS?
Most states have their own standards in all subject areas, including ELA, mathematics, science, social studies, etc. As states work to adopt the NGSS, they will replace their current state science standards with the NGSS. As we noted above, it’s important to remember that if, how, and when states adopt the NGSS and what kinds of professional development and other forms of support they plan provide for science educators will vary significantly from state-to-state.

Q: Are the NGSS a part of the Common Core State Standards? How are the Common Core State Standards (CCSS) related to the NGSS?
The NGSS address science in the same way that the Common Core State Standards address math and English Language Arts. NGSS and Common Core work in tandem to provide a seamless system of K-12 STEM education.

While there are no expectations about what students should be able to know and do in science, the Common Core English language arts standards have expectations for students to read informational, science and technical texts. The NGSS writers worked with Common Core writers to identify key literacy connections to the specific content demands outlined in NGSS to ensure the two documents work in tandem.

The NGSS writing team also worked closely with writers of the Common Core math standards to ensure the NGSS aligns. They ensured that the NGSS does not outpace or otherwise misalign to the grade-by-grade standards. The NGSS includes connection box that contains names and codes of pre-requisite or co-requisite Common Core in mathematics and in literacy.
The Common Core initiative, which states can voluntarily adopt, is sponsored by the National Governors Association and the Council of Chief State School Officers and is a state-led effort that established a single set of educational standards for kindergarten through 12th grade in English language arts (ELA) and mathematics. Forty-five states, the District of Columbia, four territories, and the Department of Defense Education Activity have adopted the Common Core State Standards and are working to implement them. Two consortia of states are working to develop common assessments.

The Next Generation Science Standards were developed in a similar but separate process. Managed by Achieve, Inc., 26 states led the NGSS development, with a 41-member writing team (many of them classroom teachers), and in collaboration with many stakeholders and experts in science, science education, higher education, and industry. The standards are based on the National Research Council’s *Framework for K-12 Science Education*. NSTA was a partner in the development of the standards, along with Achieve; the National Research Council, a staffing arm of the National Academy of Sciences; and the American Association for the Advancement of Science.

**Q: Is the federal government involved in the development of the Next Generation Science Standards?**

No. The federal government is not involved in this effort and no federal funds have been used to develop the standards. It is led by states, and they will decide whether to adopt the standards. The work undertaken by both the NRC and Achieve is being supported by the Carnegie Corporation of New York.

**Q: Are common assessments being developed to support NGSS, similar to those developed for Common Core?**

The National Research Council has convened a panel of experts in science, science education, and assessment to develop a conceptual framework for K–12 assessments. It will make recommendations on the steps needed to develop assessments that are aligned with the standards and are valid, reliable, and fair. The project, Developing Assessment of Science Proficiency in K–12, can be found at [http://sites.nationalacademies.org/dbasse/bota/currentprojects/dbasse_071506](http://sites.nationalacademies.org/dbasse/bota/currentprojects/dbasse_071506). Once states have adopted the NGSS, they may choose to develop assessments independently or work together with other states in a process similar to the Common Core State Standards in English language arts and mathematics.

**Q: Will the partners who led the NGSS development process create common resources and materials to support NGSS implementation?**

States that adopt the NGSS may choose to work together to develop instructional materials and curricula. As more states adopt, it is expected that publishers of instructional materials and experienced educators will develop additional resources. NSTA is developing a host of resources for science teachers, including a web portal to vet NGSS resources, many institutes and professional development for teachers, and numerous books and publications. Find them all at [www.nsta.org/ngss](http://www.nsta.org/ngss).
Q: Will districts and schools need to change their course offerings at middle and high school to meet the NGSS?

The NGSS do not prescribe any particular course structure. They focus on student outcomes, not curricula. It will be up to states as they begin working on implementation to think about how to structure their middle and high school courses. The NGSS do provide some model options for states and schools to consider.

Q: What can schools and district leaders do to support their science teachers and the NGSS?

Teachers will need a significant amount of professional development to work toward the goals of the NGSS. NSTA conducted a survey of its membership asking about their perceived needs for professional development. Teachers indicated a strong need for the following types of offerings.

- Interpreting the standards
- Understanding the relationship between performance expectations and instruction
- Designing instructional strategies
- Addressing the needs of students with different levels of ability
- Incorporating engineering and technology into the curriculum
- Assessing whether students have achieved the standards
- Knowing what it looks like in the classroom

NSTA’s extensive professional development programs, resources, and materials will help teachers work to build school capacity for the new science standards. (see below)

Q: What is NSTA doing to support the implementation of the NGSS in schools?

NSTA will play a central role in helping states, schools, and teachers implement the Next Generation Science Standards. A major effort now in development is an NGSS web portal to serve as a home base for science teachers. The portal will vet NGSS-aligned resources, enable teachers to view the standards in multiple formats, identify and share targeted resources, interact and collaborate with colleagues, and locate tools to plan instruction and professional development.

NSTA has compiled multiple resources for teachers as they prepare for implementation of the standards. Teachers can now access web seminars, articles from peer-reviewed journals, NSTA Press books, short courses and face-to-face conference lectures and workshops, all designed to build an understanding of the standards and provide a pathway for putting the standards into classroom instruction. You will find all these resources, and more, online at www.nsta.org/ngss.
Q: How are teachers going to be able to teach engineering to students, especially at the elementary level?

In many situations new instructional materials will be needed that include the engineering practices and engineering design disciplinary core ideas. In other situations the instructional materials already have engineering type activities, such as designing and building structures and bridges, but the materials need some adaptation to include the language of the engineering practices and engineering design. In both cases professional development will be needed to assist teachers with the shift in instructional emphasis.

Q: Will teacher preparation programs need to change to support the new standards?

Yes. The way we prepare teachers will certainly need to change to reflect the new ideas and concepts in the Next Generation Science Standards.

Additional FAQs can be found on the Next Generation Science Standards website at www.nextgenscience.org.