



## Developing Next Generation Science Standards

### Overview

Through a collaborative, state-led process, new K–12 science standards are being developed that will be rich in content and practice, arranged in a coherent manner across disciplines and grades to provide all students an internationally benchmarked science education. The *Next Generation Science Standards* will be based on the *Framework for K–12 Science Education* developed by the National Research Council. The NGSS should be completed in late 2012.

### Background

There is no doubt that science—and, therefore, science education—is central to the lives of all Americans. Never before has our world been so complex and science knowledge so critical to making sense of it all. Whether it is comprehending current events, choosing and using technology or making informed decisions about one’s healthcare, science understanding is key. Science is also at the heart of the United States’ ability to continue to innovate, lead and create the jobs of the future. All students—from technicians in a hospital to workers in a high tech manufacturing facility to Ph.D. researchers—must have a solid K–12 science education.

It has been 15 years since science standards have been comprehensively reviewed. The National Research Council’s *National Science Education Standards* and the American Association for the Advancement of Science’s *Benchmarks for Science Literacy*, while critical to the field for the past 15 years, do not reflect the changes we have experienced in society or science, such as the availability of the internet, access to cell phones, and even the changes within science such as the emergence of biotechnology and changes of how we see our own solar system (for example, Pluto). Needless to say, a lot has happened in the world of science and our knowledge of science learning in 15 years. In addition, there has been a significant amount of research into how students learn science. The time is right to take a fresh look at science standards.

### Step One: Getting the Science Right

The National Research Council, the National Science Teachers Association, the American Association for the Advancement of Science, and Achieve have embarked on a two-step process to develop the *Next Generation Science Standards*. The National Research Council (NRC), the functional staff arm of the National Academy of Sciences, began the process by developing the *Framework for K–12 Science Education*, which was published in July 2011. The *Framework* is a critical first step because it is grounded in the most current research on science and science learning and will identify the science all K–12 students should know. To undertake this effort, the NRC convened a committee of 18 individuals who are nationally and internationally known in their respective fields. The committee included practicing scientists, including two Nobel laureates, cognitive scientists, science education researchers, and science education standards and policy experts. In addition, the NRC used four design teams to develop the framework. These four design teams, in physical science, life science, earth/space science, and engineering, developed the framework for their respective disciplinary area. The NRC released a public



draft in July of 2010 and considered all feedback prior to releasing the final Framework.

### **Step Two: States Developing Next Generation Science Standards**

In a process managed by Achieve, states will lead the development of rigorous and internationally-benchmarked science standards that will be faithful to the *Framework*. These *Next Generation Science Standards*, will be developed through collaboration between states and other stakeholders in science, science education, higher education, business and industry. Additional review and guidance will be provided by advisory boards composed of nationally-recognized leaders in science, science education as well as business and industry. As part of the development process, the standards will undergo multiple reviews from many stakeholders including two public drafts, allowing all who have a stake in science education an opportunity to inform the proposed content and organization of the standards. This process will produce a set of excellent, K–12 *Next Generation Science Standards* ready for state adoption. Whether individual states decide to adopt them and whether they become consistent between the states will ultimately be up to the states themselves.

### **Process for Developing Next Generation Science Standards**

Next Generation Science Standards development work will begin with *State teams*, which will provide confidential and continuous feedback throughout the development process. States are strongly encouraged to involve representation of the K–12 education, education policy, scientific, post-secondary education, and informal science communities. All states were invited to apply to be one of the Lead Partner States, which will take a leadership role in the NGSS process from the beginning. The Lead Partner States will guide the writing team and will also work together to develop plans for adoption, implementation and transition that can be considered by other states.

The *writing team*, composed of 40 members from 26 states, represents states, K–12 and postsecondary education, and the scientific, engineering, and business communities. The members will have expertise in cognitive, life, earth, and physical sciences and engineering. The writing team is charged with creating draft standards true to the NRC *Framework* and will do so in a process that takes into account feedback from states and stakeholders.

In addition to the state teams and writers there will be a *critical stakeholder team* of hundreds of members, representing K–12 educators, administrators, higher education faculty, scientists, engineers, business leaders, policymakers, and key organizations. This team will provide confidential feedback at critical points in the development process. In addition to these established teams and feedback loops, there will be opportunities for *public review*. The standards will be released for public comment twice during the development process before the final document is released.

### **Timeline**

The release of the *Next Generation Science Standards* is expected in Fall 2012, with public drafts available in winter 2011/12 and summer of 2012.

The development of the *Framework for K–12 Science Education* and the *Next Generation Science Standards* is supported by the Carnegie Foundation.