

SCIENCE EDUCATION IN THE 21ST CENTURY

Why K–12 Science Standards Matter—and why the time is right to develop Next Generation Science Standards

Through a collaborative, state-led process, new K–12 science standards were developed that 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 Next Generation Science Standards are based on the Framework for K–12 Science Education developed by the National Research Council. The NGSS were completed in April 2013.

Why Next Generation Science Standards (NGSS)?

- It has been more than 15 years since state science education standards’ guiding documents were developed. Since that time, many advances have occurred in the fields of science and science education, as well as in the innovation-driven economy.
- The U.S. has a leaky K–12 STEM talent pipeline, with too few students entering STEM majors and careers at every level—from those with relevant postsecondary certificates to PhD’s. We need new science standards that stimulate and build interest in STEM.
- We can’t successfully prepare students for college, careers and citizenship unless we set the right expectations and goals. While standards alone are no silver bullet, they do provide the necessary foundation for local decisions about curriculum, assessments, and instruction.
- Implementing improved K–12 science standards will better prepare high school graduates for the rigors of college and careers. In turn, employers will be able to hire workers with strong science-based skills—including specific content areas but also skills such as critical thinking and inquiry-based problem solving.

What’s Different in the Next Generation Science Standards?

- Every NGSS standard has three dimensions: disciplinary core ideas (content), scientific and engineering practices and cross-cutting concepts. Currently, most state and district standards express these dimensions as separate entities, leading to their separation in both instruction and assessment. The integration of rigorous content and application reflects how science is practiced in the real world.
- Science and Engineering Practices and Crosscutting Concepts are designed so as not be taught in a vacuum; the NGSS encourage integration with multiple core concepts throughout each year.
- Science concepts will build coherently across K-12. The emphasis of the NGSS is a focused and coherent progression of knowledge from grade band to grade band, allowing for a dynamic process of building knowledge throughout a student’s entire K-12 scientific education.
- The NGSS focus on a smaller set of Disciplinary Core Ideas that all students should know by the time they graduate from high school – focus involving deeper understanding and application of content than the often fact-driven standards currently in use in states and districts.

- Science and engineering are integrated into science education by raising engineering design to the same level as scientific inquiry in science classroom instruction at all levels, and by emphasizing the core ideas of engineering and technology.
- The NGSS coordinate with English language arts and Mathematics Common Core State Standards. This allows an opportunity both for science to be a part of a child's comprehensive education as well as ensuring an aligned pace of learning in all content areas. The three sets of standards overlap in meaningful and substantive ways.

Key Milestones in the Development of the Next Generation Science Standards

- Fall 2011 – Lead states and writers identified
- Winter 2011 – Confidential Lead State draft
- Winter 2011 – Writing team reacts to review
- Winter 2012 – College and Career Readiness Advisory Meeting
- Winter 2012 – Lead State and critical stakeholders draft
- Spring 2012 – Writing team reacts to review
- May 11–June 1 2012 – First public draft comment period
- Summer 2012 – College and Career Ready Review
- Summer 2012 – Writing team reacts to reviews
- Fall 2012 – Confidential State and critical stakeholder draft
- Fall 2012 – Writing team reacts to review
- Fall 2012 – Finalize the College and Career Ready Definition
- Fall 2012 – Revise draft based on new College and Career Ready Definition
- January 2013 – Second public draft comment period
- Winter 2013 – Writing team reacts to review
- April 2013 – Next Generation Science Standards released for adoption