High School Information and Resource Guide

CCSESA
California County Superintendents Educational Services Association

NEXT GENERATION SCIENCE STANDARDS

CISC
Curriculum and Instruction Steering Committee

The United States economy is growing with jobs that require Science, Technology, Engineering, and Mathematics (STEM) skills at a rate of three times faster than non-STEM jobs (Langdon et al., 2011). So, how do we prepare our next generation of innovators, scientists, artists, engineers, entrepreneurs, doctors, explorers, and leaders? The Next Generation Science Standards (NGSS), California's new science standards, will prepare students with 21st Century Skills required to compete and lead in a changing world.

What is NGSS?

The NGSS reflects the vision for all students to learn science in a relevant and meaningful way by integrating 3-dimensions. The 3-dimensions of NGSS supports teachers in the design and utilization of curriculum that will engage students in learning by focusing on the science and engineering practices, crosscutting concepts, and disciplinary core ideas of science that transform instruction and improves science education to better prepare students for college and careers.

"...currently (there are) between 2-3 million unfilled positions in a STEM areas of science..."

-Next Generation Science Standards, Appendix C

What are the 3-dimensions of NGSS?

- **Science and Engineering Practices** for high school students are the application of principles, skills, and tools that scientists and engineers use in the real-world.
- **Crosscutting Concepts** are the connections between the different disciplines that communicate science and engineering.
- **Disciplinary Core Ideas** focus on developing the depth of science content knowledge in a coherent and thoughtful way using scientific and engineering practices as the vehicle for strengthening the mastery of science learning over time.

"All (NGSS) Standards, All Students" promises that all students will be engaged in rigorous K-12 science education.

A Framework for K-12 Science Education

Why do we need new standards?

Students are facing a changing economy that demands the application of STEM skills. STEM jobs necessitate critical thinking, strong communication skills, ability to work with people and collaborate, and creativity to solve real-world problems. NGSS uses performance expectations to reflect the integration of the 3-dimensions in order for students to demonstrate how much they understand and can apply science and engineering. Instructional shifts by teachers will prepare students to be successful in achieving these NGSS performance expectations and will open the door for all learners—fulfilling the promise of a more diverse STEM workforce.

What does a high school NGSS classroom look like?

Students will experience science through inquiry, development of models, creation of solutions to problems, and the collection of authentic data. These experiences are the applications of the scientific and engineering practices that students will encounter in future STEM-related fields. Students will apply and communicate crosscutting concepts throughout high school by supporting scientific claims with evidence and by engaging in scientific discourse. Students will develop a deeper understanding of science because they will be integrating information from multiple disciplines of science rather than learning them in isolation from one another. NGSS high school courses are developed at a local level. This enables schools and districts to identify their own pathways for students.

OFFICE OF EDUCATION VENTURA COUNTY

When will NGSS be fully implemented and assessed?

The California State Board of Education adopted NGSS in September 2013 and they are now the new science standards for the state. There is a 3-phase rollout planned to implement the NGSS. Schools will begin with the "Awareness Phase" of implementation to develop teachers' understanding of the instructional shifts and changes in standards. In the "Transition Phase" of NGSS implementation, schools and districts will determine which additional resources and professional learning opportunities are needed to support movement into the "Implementation Phase." In this final phase, teachers will strategically integrate the 3-dimensions and fully align their curriculum, instruction, and assessments as a result of continuous support and on-going professional learning. In the future, schools and districts will administer new science assessments that reflect the performance expectations of NGSS.

NGSS prepares all learners to work in a diverse STEM economy.

Implementation Plan Guidelines

Awareness Phase	Transition Phase	Implementation Phase
• Introduction of NGSS • Initial planning of systems • Establishment of collaboration	• Building foundational resources • Implementing needs assessments • Establishing new professional learning opportunities • Expanding collaboration between all stakeholders	• Expanding new professional learning support • Fully aligning curriculum, instruction, and assessments • Effectively integrating all elements across the field

How can I support student success and facilitate NGSS implementation?

- Participate in meetings that seek input to prioritize the district and school's Local Control and Accountability Plan (LCAP). LCAP is the document that will support the successful implementation of NGSS at the local level.
- Be an advocate for NGSS by attending school and community STEM events.
- Form a strong partnership with districts, schools, and teachers by volunteering to be a speaker and provide resources for implementing the scientific and engineering practices.
- Share NGSS information and resources with stakeholders to increase awareness by attending public and community meetings.

Web Resources

- California Department of Education Professional Learning Resources: http://www.cde.ca.gov/
- Next Generation Science Standards: For States, By States: http://www.nextgenscience.org/
- California Science Teachers Association Resources: http://www.cascience.org/
- National Science Teachers Association Resources: http://www.nsta.org/
- Achieve: http://www.achieve.org/

Langdon, D., McKittrick, G., Beede D., Khan, B., and Doms, M. (2011, July). STEM: Good jobs now and for the future. *Department of Commerce, Economics and Statistics Administration.*

Developed by the Ventura County Office of Education

SCIENCE
NGSS app