

Bringing science to life as a core subject

NGSS Early Implementers demonstrated progress and gained experience that benefits others.

Implementing Next Generation Science Standards

A diverse group of eight California school districts and two charter management organizations were at the forefront of implementing Next Generation Science Standards. Their progress, experiences, and lessons can inform others implementing NGSS. The NGSS Early Implementers were supported by the K-12 Alliance at WestEd, working in partnership with the California Department of Education, the California State Board of Education, and Achieve. Initiative funding was provided by the S. D. Bechtel, Jr. Foundation, with the Hastings/Quillin Fund supporting participation by the charter organizations.

The Early Implementers initiative

The initiative spanned 2014 to 2020. It focused on NGSS implementation in grades K-8 and incorporated the integrated course model (preferred by the California State Board of Education) for middle school.

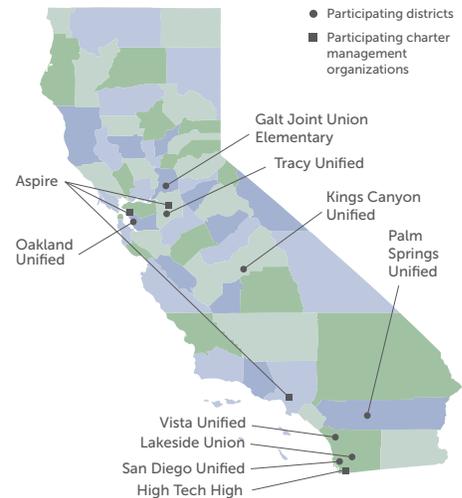
Teachers were supported with strategies and tools including an instructional framework incorporating phenomena-based learning. This framework aligned with the NGSS three dimensions — encompassing disciplinary core ideas, crosscutting concepts, and science and engineering practices. Using science notebooks, questioning strategies, and other approaches, students conducted investigations, constructed arguments, analyzed text, practiced descriptive skills, articulated ideas, and assessed their own understanding.

Teachers engaged in science lesson studies twice each year through a Teaching Learning Collaborative. In each district, the initiative was guided by a core leadership team of teacher leaders and administrators who participated in additional professional learning and coaching activities. Together, this core team and an extended group of teacher leaders were the means for scaling NGSS implementation throughout the district.

NGSS engages students and teachers in valuable ways

Participating districts worked to establish science as a core subject in grades K-8. Their early efforts demonstrated the benefits of science instruction that is inquiry-based and student-centered. Their experience reinforced the lessons and messages generated by others active with the new science standards nationally and locally, including The California Alliance for NGSS (CA4NGSS). Early Implementers reported that:

- » **Kids like learning science.** It taps into the natural curiosity and energy of every child. Science instruction kindles and expands this curiosity when it incorporates phenomena and connects to the life experiences of young people.
- » **NGSS helps students learn *all* subjects.** When students engage with these science concepts and content it broadens their knowledge base and heightens their interest in reading and writing. It can benefit even reluctant readers and writers, and English language learners as well as native speakers.
- » **NGSS helps teachers improve *all* instruction.** Teachers like this approach to science too. It facilitates active learning, providing students with rich content they can read, debate, and write about in English language arts (ELA) classes, use to solve math problems, and more. Science knowledge fuels self-driven learning across a continuum of subjects and skills.



Instructing with NGSS is doable — regardless of experience level

The experience of Early Implementers showed that teachers, schools, and districts — regardless of their relative experience with science — can instruct to the new standards. Approaches to improving science learning have been designed and tested in classrooms and schools within districts of differing sizes and demographics, and with teachers and administrators who have minimal or extensive prior experience.

I enjoyed incorporating science into English language arts time. The shift was easy and efficient. The students were captivated and were inquisitive.

EARLY IMPLEMENTER TEACHER

Success requires professional learning for teachers and administrators

Participating districts found that it takes time and effort to gain the content and skills needed to deliver quality science instruction. This investment is required at all levels — including district curricula leaders, school building leaders, and teachers. These parties must share a joint vision, as well as expectations, for the benefits that teaching science will generate and for the level of combined effort it will require. The results are worth it — and teachers and administrators who participated in professional learning and collaborated with colleagues reported feeling energized and prepared to lead science instruction.

Evaluation and reports

The S. D. Bechtel, Jr. Foundation commissioned WestEd's STEM Evaluation Unit independently of the K–12 Alliance to evaluate the initiative in the eight public school districts. This evaluation was advised by a technical working group that included the California Department of Education and the State Board of Education.

Special resources and reports

[Next Generation Science Standards in Practice: Tools and Processes Used by the California NGSS Early Implementers](#) (May 2018)

[The Future of California Science: A Story of Leadership, Collaboration, and Legacy](#) (July 2020)

Published evaluations

1. [The Needle is Moving in CA K–8 Science: Integration with English Language Arts, Integration of Sciences, and Returning Science as a Core Subject](#) (October 2016)
2. [The Synergy of Science and English Language Arts: Means and Mutual Benefits of Integration](#) (October 2017)
3. [Administrators Matter in NGSS Implementation: How School and District Leaders Are Making Science Happen](#) (November 2017)
4. [Developing District Plans for NGSS Implementation: Preventing Detours and Finding Express Lanes on the Journey to Implement the New Science Standards](#) (February 2018)
5. [Making Middle School Science Whole: Transitioning to an Integrated Approach to Science Instruction](#) (October 2018)
6. [Engaged and Learning Science: How Students Benefit from Next Generation Science Standards Teaching](#) (November 2018)
7. [Investing in Science Teacher Leadership: Strategies and Impact in the NGSS Early Implementers Initiative](#) (February 2019)
8. [Collaborative Lesson Studies: Powerful Professional Learning for Implementing the Next Generation Science Standards](#) (September 2019)
9. [Environmental Instruction Catalyzes Standards-Based Science Teaching: How Environmental Literacy Aids Implementation of the NGSS](#) (September 2019)
10. [Administrators Matter in NGSS Implementation \(2019\): Updated Findings on How School and District Leaders Are Making Science Happen](#) (October 2019)
11. [It's About TIME: A Rigorous New Process for Selecting Instructional Materials for Science](#) (June 2020)
12. [Six Years of Scaling Up: Districtwide Implementations of the Next Generation Science Standards](#) (August 2020)
13. [NGSS in the Classroom: What Early Implementer Science Instruction Looks Like](#) (September 2020)
14. [What Education Leaders Can Learn About NGSS Implementation: Highlights From the Early Implementers Initiative](#)

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