

# Science Standards: A New Vision

**T**he Next Generation Science Standards (NGSS) reflect a new vision for science education that requires significant changes in the classroom. Students and parents aren't the only ones worried about these rigorous new student performance expectations—teachers are, too. It's up to school leaders to make the transition as painless as possible.

What's exciting about the NGSS is that they better reflect the connections between science and engineering practices, allowing students to experience science in a relevant, real-world manner, building deeper understanding of science concepts as well as applying knowledge. This represents an important step forward in preparing students for college and careers.

At the same time, the NGSS can seem intimidating, especially for teachers who haven't taught science before. At the elementary level in particular, teachers' backgrounds can vary. Many were not STEM majors and may not have had experience with scientific practices. Even for those teachers with science experience, though, the new standards will challenge them to teach differently.

An added complication is that many schools haven't yet implemented curricular materials aligned to the new standards. This leaves teachers feeling even more overwhelmed, knowing that they'll have to find inquiry-based curriculum materials and hands-on experiments to cover the concepts their students need to understand.

The best way to roll out the NGSS is to provide teachers with a clear vision, the right resources, and plenty of support. Here are a few ways to ease the transition to the new standards for teachers in your school.

**Start with deep professional development, including hands-on lessons.** For the past two years in our district, we provided training

for teachers on the structure and progression of the NGSS, and the 5E model of instruction (Engage, Explore, Explain, Elaborate, and Evaluate). We also held a daylong institute, organized by grade level, in which teachers experienced an inquiry-based, student-centered lesson aligned to one of the standards.

**Take the guesswork out of teaching the NGSS.** One of the biggest obstacles we faced in moving to the NGSS in my state, California, was that all of our instructional materials were aligned to the 1998 Science Content Standards for California. We needed a resource that would make the NGSS engaging and exciting for students as well as teachers, and support teachers in making the transition. So, after careful evaluation, we chose a hands-on, digital STEM curriculum called STEMscopes, developed by Accelerate Learning and Rice University.


We chose this program primarily because it's digital and built from the ground up to meet the NGSS. We like that it places at teachers' fingertips problem-based learning, engineering challenges, scientific investigations, math and literacy connections, and culminating claim-evidence-reasoning assessments, so they can easily help students understand the NGSS as they were designed.

Whatever curriculum you're using, make sure to offer teachers as many digital resources, supplemental print materials, and hands-on exploration kits as possible. This allows teachers to easily adapt the program to their teaching styles and classrooms.

**Connect the NGSS with work you're doing to improve teaching and learning in other subjects.** Many of our teachers felt uncomfortable teaching science. Because the NGSS overlaps with many state and Common Core standards for math and English-language arts (ELA), we built our program to include cross-curricular connections that enable teachers to integrate science into all of the content areas. Strong vertical alignment also allows teachers to develop student expectations across grade levels with parallel lesson design.

**Provide ongoing training.** NGSS training and implementation is an ongoing process. I suggest monthly training so that teachers have time to process new information and practice new skills, but not so much time to "tuck it away" and forget or give up on things that didn't work. I also suggest having an on-site expert, whose only role is to help them grow and succeed during this time of transition.

**Empower teachers to support your school's vision.** Of course, implementing the NGSS requires more than the right tools and training. It also requires a clear vision. One of our district's missions is to drive inquiry-based learning. Inquiry-based instruction helps students build their own knowledge and understanding of STEM, which deepens their learning. It also increases their engagement while helping them prepare for the new science assessments. Ask yourself what your school's vision for science education will be and how you'll bring teachers on board with it.

In our schools, we believe a STEM education is important to help students solve real-world problems, understand how things work, and make math and science relevant. The integration of all the disciplines and 21st century learning skills will also help students become more competitive in the global job market. 

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