

California Alliance for the Next Generation Science Standards (CA4NGSS)

An Overview for Principals

Principals have a critical role to play in the California Standards process. The purposes of this document is to introduce principals to California’s Next Generation Science Standards (CA-NGSS) and provide a general overview of the key instructional and conceptual shifts required by the CA-NGSS.

What are the CA-NGSS?

California’s Next Generation Science Standards require science and engineering to be taught in every grade K-12 to build understanding and skills systematically year on year, so all students receive a strong science education that prepares them for productive futures, no matter what their educational and career path will be.

What do the CA-NGSS mean for classroom instruction?

By introducing science at an earlier age to all students, the CA-NGSS embrace a young person’s innate curiosity. The CA-NGSS also represent a fundamental shift in focus away from memorizing facts *to doing* science and engineering, encouraging students to ask lots of questions and emphasizing hands-on investigation and discovery.

In the classroom, this looks like **“three-dimensional” (3D) learning**. 3D learning refers to the thoughtful and deliberate integration of three dimensions of the CA-NGSS: Scientific and Engineering Practices (SEPs), Disciplinary Core Ideas (DCIs), and Crosscutting Concepts (CCCs).

Enabling students to view science more as it relates to the real world, like scientists and engineers do, rather than as an isolated set of disciplines. This is a more engaging approach to teaching and in line with what we know about how students learn best.

Looking ahead, teachers can use a range of strategies to engage students and create opportunities to demonstrate their thinking and learning.

Specifically, how will science education change with the CA-NGSS?

Science education will involve more:

1. Systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned
2. Students conducting investigations, solving problems, and engaging in discussions with teacher guidance
3. Students discussing open-ended questions that focus on the strengths of the evidence used to generate claims
4. Students reading multiple sources and developing summaries of information
5. Student writing of journals, reports, posters, and media presentations that offer explanations and arguments
6. Provision of supports so that all students can engage in sophisticated science and engineering practices

Science education will involve less:

1. Learning of ideas disconnected from questions about phenomena
2. Teachers providing information to the whole class
3. Teachers posing questions with only one right answer
4. Students reading and answering questions at the end of each chapter
5. Worksheets
6. Oversimplification of activities for students who are perceived to be “less able” to do science and engineering

What Are Next Steps for Principals?

It's important that teachers and school leaders have time and access to ongoing professional learning experiences and supports to help make changes in classroom instruction, as well as in the administrative practices and policies that support good instruction.

What are key questions that principals should consider during implementation?

- What kind of professional development is available for teachers and myself?
- What standards-aligned instructional materials are available and how do I know if they are high quality?
- How can we connect the California's Next Generation Science Standards to California's updated Standards in [English Language Arts, math, and English Language Development](#)?

What can principals do to support implementation?

- Focus on what students are doing first and then think about what the teacher has designed
- Work with teachers and community members to build a long-term plan that focuses on a collective vision for science education
- Elevate teacher leaders and support them as they work to help their colleagues
- Seek out and provide high-quality professional learning to all teachers

What are some common pitfalls that can undermine successful implementation?

- Expecting instruction to change overnight
- Expecting teachers to do it alone
- Failing to communicate with parents and community about what is changing and why you are changing it
- Asking, "Which standard are you teaching today?"

For more information about CA-NGSS, visit CA4NGSS.org and:

- The **California Department of Education's** webpage: <http://www.cde.ca.gov/pd/ca/sc/ngssintrod.asp>
- The **California Science Teachers Association (CSTA)**'s webpage: <http://www.cascience.org/csta/ngss.asp>; and monthly newsletter, "California Classroom Science": <http://www.classroomscience.org/>
- **Achieve's** Next Generation Science Standards website: <http://www.nextgenscience.org/>; and monthly newsletter, "NGSS Now": <http://www.nextgenscience.org/content/newsletter-signup>
- The **National Science Teachers Association (NSTA)**'s NGSS@NSTA website: <http://ngss.nsta.org/>
- STEM Teaching Tools: <http://stemteachingtools.org/>

Prepared for CA4NGSS by the CDE Foundation, CSTA, Children Now, and ACSA. Content represents coalition member input but does not reflect each member organization's formal endorsement. Visit CA4NGSS.org for more information.