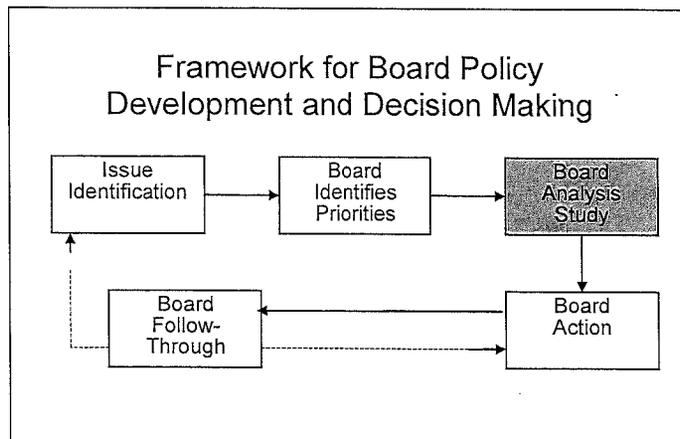


Iowa State Board of Education

Executive Summary

November 14, 2012



- Agenda Item:** Next Generation Science Standards Update
- Iowa Goal:** All PK -12 students will achieve at a high level.
- State Board Role/Authority:** This draft of the Next Generation Science Standards is being shared with the State Board for informational purposes.
- Presenters:** Lea Davidson, Chief
Bureau of Standards and Curriculum
- Yvette McCulley, Consultant
Bureau of Standards and Curriculum
- Attachments:** 1
- Recommendation:** It is recommended that the State Board hear and discuss this information.
- Background:** Currently, Iowa and 25 other states are working with 40 national writers to develop a new set of educational science standards for students in grades K-12. The new standards have been set to internationally competitive levels in science. This means that students may be more challenged by the material they study. In addition to learning science content, students will be required to apply their knowledge to understand how science concepts fit together. In February of 2012, when 800 registered voters across the states were asked if they would favor or oppose implementing these new standards for science, 97 percent believed that improving science education is important to our country's ability to compete globally.



Science Education for a New Generation

Framework for K-12 Science Education Fact Sheet

What is the Framework for K-12 Science Education?

The Framework is a document that outlines a broad set of expectations for science and engineering education in grades K-12. It is the first of a two-stage process to produce a next generation set of science standards for voluntary adoption by states.

How was the Framework Developed?

An 18-member committee—including nationally and internationally known practicing scientists, cognitive scientists, science education researchers, and science education standards and policy experts—appointed by the National Research Council of the National Academies of Sciences developed the Framework.

The Framework underwent revisions based on a rigorous peer-review process as well as public scrutiny and feedback before it was finalized.

Who will use the Framework?

- Developers of the Next Generation Science Standards
- State and District Science Administrators
- Assessment Developers
- Curriculum Designers
- Professional Learning Providers
- Pre-service Educators
- Science Educators

Why Do We Need a Framework?

The Framework is designed to help realize a vision for science and engineering education in which students, over multiple years of school, actively engage in science and engineering practices and apply crosscutting concepts to deepen their understanding of the core ideas in scientific disciplines.

It is important to note, this vision applies to ALL students, not just those who pursue careers in science, engineering, or technology, or those who continue on to higher education.

How will the Framework Impact Science Education?

- Prepare students for their roles as citizens in a technology rich and scientifically complex world.
- Provide the foundation for the Next Generation Science Standards.
- Lead to the development of related professional development materials, assessments, and curriculum/instructional programs.
- Promote uniformity of science standards across multiple states.
- Raise student understanding of practices of science and engineering.

Where Can I Find the Framework?

www.nap.edu/catalog.php?record_id=13165

Three Dimensions of the Framework

The three dimensions of the Framework are presented in separate chapters. However, in order to facilitate students' learning, the dimensions must be woven together in standards, curricula, instruction, and assessments.

<p>Science and Engineering Practices</p> <ol style="list-style-type: none"> 1. Asking Questions and Defining Problems 2. Developing and Using Models 3. Planning and Carrying Out Investigations 4. Analyzing and Interpreting Data 5. Using Mathematics and Computational Thinking 6. Constructing Explanations and Designing Solutions 7. Engaging in Argument from Evidence 8. Obtaining, Evaluating, and Communicating Information 	<p>Disciplinary Core Ideas</p> <p><u>Physical Sciences</u></p> <p>PS 1: Matter and Its Interactions</p> <p>PS 2: Motion and Stability: Forces and Interactions</p> <p>PS 3: Energy</p> <p>PS 4: Waves and Their Applications in Technologies for Information Transfer</p> <p><u>Life Sciences</u></p> <p>LS 1: From Molecules to Organisms: Structures and Processes</p> <p>LS 2: Ecosystems: Interactions, Energy, and Dynamics</p> <p>LS 3: Heredity: Inheritance and Variation of Traits</p> <p>LS 4: Biological Evolution: Unity and Diversity</p> <p><u>Earth and Space Sciences</u></p> <p>ESS 1: Earth's Place in the Universe</p> <p>ESS 2: Earth's Systems</p> <p>ESS 3: Earth and Human Activity</p> <p><u>Engineering, Technology, and the Applications of Science</u></p> <p>ETS 1: Engineering Design</p> <p>ETS 2: Links Among Engineering, Technology, Science and Society</p>
<p>Crosscutting Concepts</p> <p><i>These concepts unify the study of science and engineering through their common application across fields.</i></p> <ol style="list-style-type: none"> 1. Patterns 2. Cause and Effect 3. Scale, Proportion and Quantity 4. Systems and System Models 5. Energy and Matter <ol style="list-style-type: none"> • Structure and Function 7. Stability and Change 	