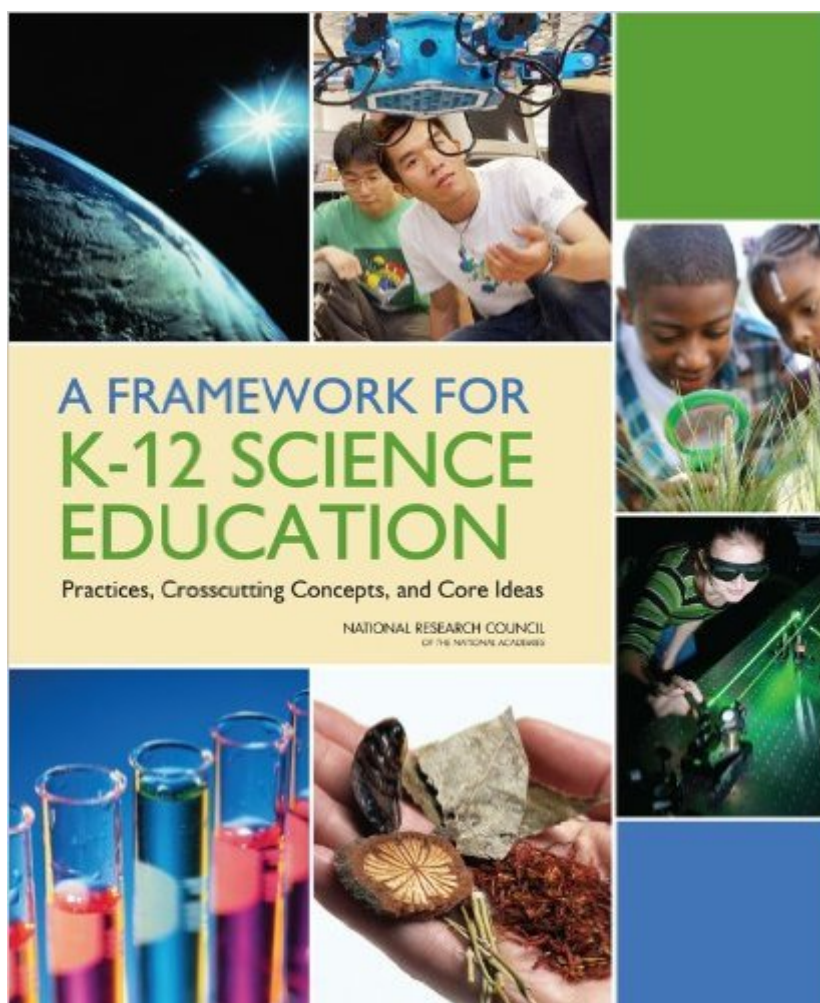


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# A Framework For K-12 Science Education: Practices, Crosscutting Concepts, And Core Ideas



## Synopsis

Science, engineering, and technology permeate nearly every facet of modern life and hold the key to solving many of humanity's most pressing current and future challenges. The United States' position in the global economy is declining, in part because U.S. workers lack fundamental knowledge in these fields. To address the critical issues of U.S. competitiveness and to better prepare the workforce, A Framework for K-12 Science Education proposes a new approach to K-12 science education that will capture students' interest and provide them with the necessary foundational knowledge in the field. A Framework for K-12 Science Education outlines a broad set of expectations for students in science and engineering in grades K-12. These expectations will inform the development of new standards for K-12 science education and, subsequently, revisions to curriculum, instruction, assessment, and professional development for educators. This book identifies three dimensions that convey the core ideas and practices around which science and engineering education in these grades should be built. These three dimensions are: crosscutting concepts that unify the study of science through their common application across science and engineering; scientific and engineering practices; and disciplinary core ideas in the physical sciences, life sciences, and earth and space sciences and for engineering, technology, and the applications of science. The overarching goal is for all high school graduates to have sufficient knowledge of science and engineering to engage in public discussions on science-related issues, be careful consumers of scientific and technical information, and enter the careers of their choice. A Framework for K-12 Science Education is the first step in a process that can inform state-level decisions and achieve a research-grounded basis for improving science instruction and learning across the country. The book will guide standards developers, teachers, curriculum designers, assessment developers, state and district science administrators, and educators who teach science in informal environments.

## Book Information

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## Customer Reviews

The Framework is the basis for the "Next Generation Science Standards" (NGSS) which Michigan's State Board of Education will consider some time in 2014. I serve on that board and wanted to understand the NGSS, so I obtained the Framework and read through it. Like many professional education treatises, it is not an easy read, having the excitement of your automobile manual, with portions of great usefulness buried amid the tedious, the obscure, and the redundant. This latter is partly because the volume was authored by a committee, a committee that qualifies much, but assumes much. Everything is footnoted, but the pages upon pages of references raise their own questions about assumptions, for one can cite many studies that share the assumptions you share but don't actually prove the point. The Framework proposes less content but deeper understanding of science concepts ("big ideas" in my words), a theme I have encountered in education literature for 40 years. Apparently nobody has gotten it right in all that time, and this framework is explicit at times, informing us that even those who have majored in science in college probably don't have the understanding of science necessary to understand science. This implies a whole change of system, how we teach kids on every level, how we prepare teachers, how we test kids, professional development, etc. At the same time, the exact sequence of concepts that ought be taught, and in what grades, is still in need of research. This is the Framework's greatest weakness. It suffers from the hype that dominates so much of educational policy discussion, not that prose is emotional, but that what is called for is simply unrealistic. How can we adopt standards if the majority of teachers don't understand science, even those who majored in it in college?

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