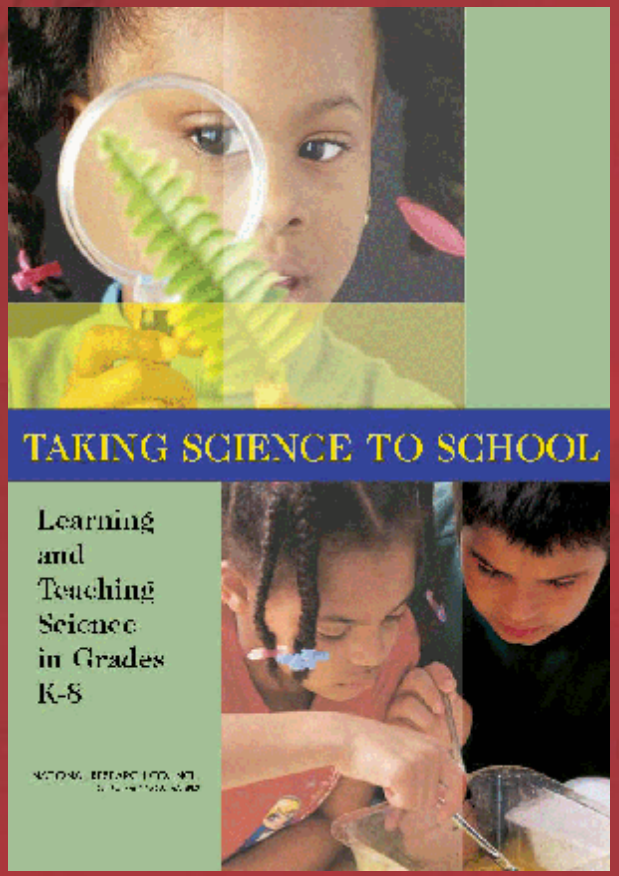
What Has Changed?
Reasons for Tackling New Science Standards



Stakeholder Meeting
October 12, 2009

THE NATIONAL ACADEMIES
Advisers to the Nation on Science, Engineering, and Medicine
National Academy of Sciences
National Academy of Engineering
Institute of Medicine
National Research Council

National Landscape

- Increased attention to STEM education
- Importance of standards in the context of accountability
- Press for common standards

Improved Evidence Base

- Lessons from over a decade of standards-based reform
- More robust research base on learning

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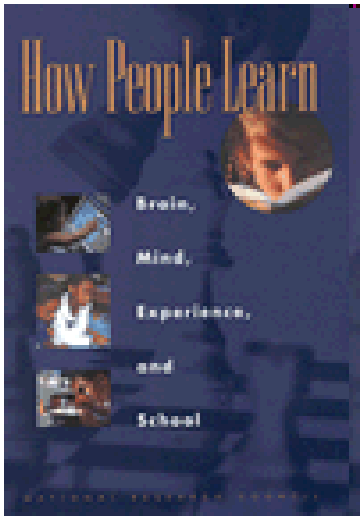
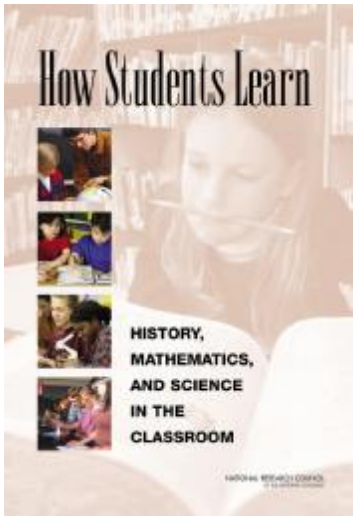
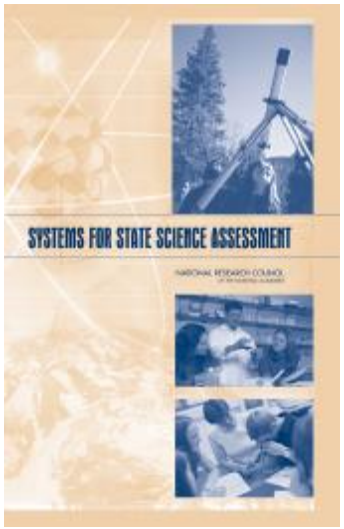
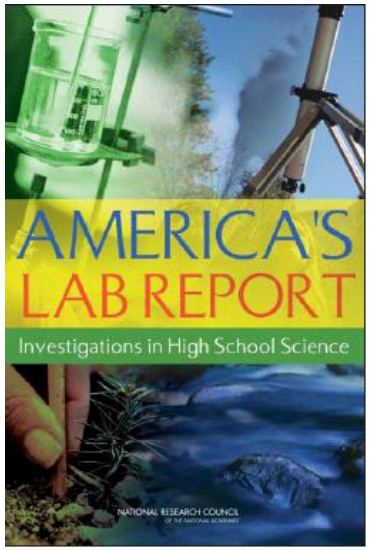
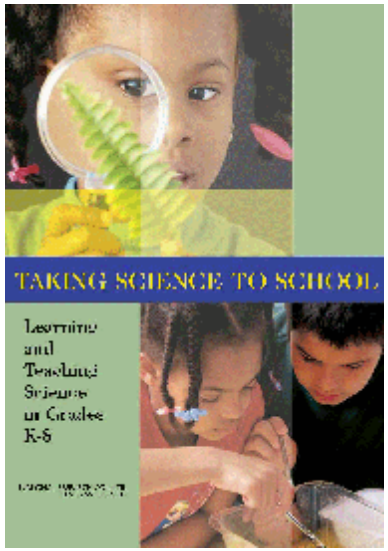
NRC & BOSE Reports Related to Learning

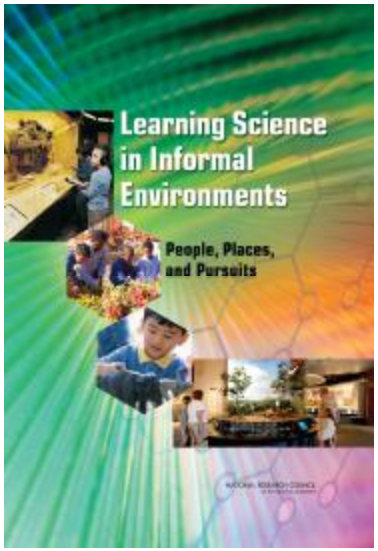












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Key Ideas from Research on Learning

Strands of Scientific Proficiency

1. Understanding scientific explanations
2. Generating scientific evidence
3. Reflecting on scientific knowledge
4. Participating productively in science

- è Not separate goals — intertwined strands during effective learning and teaching.

Core Ideas and Learning Progressions

- Major recommendation from research – organize standards around core ideas and learning progressions.

Why Core Ideas and Learning Progressions?

- Proficiency in science is more than knowing facts. It is ***not*** a simple accumulation of information.
- Factual knowledge must be placed in a conceptual framework to be well understood.
- Students need to learn how ideas are related to each other, and their implications and applications in the discipline.

Why Core Ideas and Learning Progressions?

- Many ideas in science are complex or even counter-intuitive.

- It takes time (sometimes years) to fully understand these ideas.