



## **Issue Forum #3:**

### **pK-8 Science Education**

**Leader: Midge Yergen**

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#### **Overview of Topic:**

Recent attention has been increasingly focused on the importance of science to the future of our nation. President Obama is looking toward green and environmentally healthy industries, with an associated demand for scientists and engineers as a key to growing the United States economy. We know that making science an area of emphasis is a challenge for pK-8 educators when high stakes testing in non-science areas continues to draw the attention of educational decision makers. As science leaders we must find ways to advocate for increased recognition of the value of science literacy for the health of our nation, the natural resources of the planet, the environmental quality of our communities, and the continuing development of the frontiers of science. As science leaders from across the country, helping our decision makers understand the role of pK-8 education in science literacy is key to our efforts to reach the PISA definition of science literacy (identifying science issues, explaining phenomena scientifically, and using scientific evidence).

The focus of this forum is to identify and determine action steps for increasing the teaching of science at the pK-8 levels and assist our pK-8 teachers with their science professional development at pre-service and in-service levels.

#### **Guiding Questions:**

- How do we, as state level leaders, advocate for greater emphasis on science within pK-8 classrooms?
- What resources are available for pK-8 teachers to become more widely prepared to teach science?
- How can we assist pK-8 teachers with gaps in understanding in their science content knowledge?
- \*What role do our state and federal law-makers play in pK-8 science education? How do we help them make better-informed choices?
- \*What is the potential role for and the implications of the Science Conceptual Framework on pK-8 science education?

#### **Essential Readings:**

Bybee, R.W. (2010) The teaching of science: 21<sup>st</sup> century perspectives, NSTA Press. Chapter 1

NSTA position statement on Elementary School Science,  
<http://www.nsta.org/about/positions/elementary.aspx>

## Article--**Report Calls for Improvement in K-8 Science Education**

*By Valerie Strauss*

Washington Post Staff Writer

Friday, September 22, 2006

A report released yesterday by a committee on science education says K-8 classes are in "urgent need" of improvement, just as schools must for the first time assess students on the subject under the federal No Child Left Behind Act.

The report by the National Research Council, the main operating agency of the National Academy of Sciences and the National Academy of Engineering, said that the past 15 years of reform have produced few positive results and that science education too often is based on faulty notions of how children learn.

"We are underestimating what young children are capable of as students of science -- the bar is almost always set too low," the report said. "Moreover, the current organization of science curriculum and instruction does not provide the kind of support for science learning that results in deep understanding of scientific ideas and an ability to engage in the practices of science."

The report, sponsored by the National Science Foundation, National Institute of Child Health and Human Development, and the Merck Institute for Science Education, reiterates concerns that have been expressed for years by business leaders and educators who fear the country is in danger of losing its scientific superiority because of a poorly trained workforce. It also cites the continuing achievement gap between white and Asian students and economically disadvantaged black and Latino students.

Current teaching approaches are insufficient to launch students on a path to participation in a society infused with job opportunities in scientific and technical fields," said Richard A. Duschl, professor of science education at Rutgers University and chairman of a 14-person committee that wrote the report.

Under No Child Left Behind, schools are required to assess student progress in science at the end of the current school year. Students already have been assessed in math and reading, and the goal is for students to be "proficient" in core subjects by 2014, though each state determines what proficient means.

To provide a more comprehensive science education, the committee on science education said that educators should concentrate on core concepts central to the understanding of science rather than the many strands that now exist in school systems around the country.

Science standards that have driven reforms for the past 15 years are too broad, the report said, and science education fails to link concepts within a single year and from grade to grade.

The report also said teachers need better training and that new findings on the learning process should be incorporated into curricula, including the notion that children starting school are much more sophisticated, analytical thinkers than has been assumed in the past.

"I think [the report] should be required reading for anyone who cares about our kids and how they learn science," said Gerald F. Wheeler, executive director of the National Science Teachers Association. "There are too many ideas in the [science] standards. That just throws a monkey wrench in the system. If we have some core ideas, we can really invest in the system."

One longtime battle about science education involves method: direct versus self-inquiry and hands-on learning. The report comes down on both sides, saying that one does not work without the other.

PISA 2009 Summaries <http://browse.oecdbookshop.org/oecd/pdfs/browseit/9810081E.PDF>  
pages numbered 13-15