



Sci Math^{MN} Statement on Science Standards

Intro

Statement by the SciMathMN Board of Directors supporting the Minnesota Academic Standards developed by the full Science Standards Committee. Sent to chairs of education committees in the Minnesota House and Senate, 2/17/04.

Background

Minnesota has long been a national leader in shaping the way science is taught. Our state's students have regularly scored at or near the top in leading science tests. The results from the 1995 Third International Mathematics and Science Study (TIMSS), the largest such study ever conducted, showed that Minnesota's fourth and eighth graders were among the worldwide leaders in science achievement. They were outperformed only by Korea at the fourth grade level and Singapore at the eighth grade level. National assessments, such as the National Assessment of Educational Progress (NAEP), also show the strengths of Minnesota students in science.

The state science education standards serve as the roadmap teachers use to drive excellence in Minnesota science education. The SciMath^{MN} Board of Directors strongly encourages the Minnesota legislature to bring forward the Minnesota Academic Standards for Science as developed by the full Science Standards Committee. These standards align with those developed by the two largest and most respected scientific organizations in the United States: the *National Science Education Standards* developed by the National Research Council and the *Benchmarks for Science Literacy* developed by the American Association for the Advancement of Science.

Both documents were created with significant national input from scientists. They were developed based on sound science in order to prepare our students for higher education, jobs in a wide variety of technical and scientific fields, and to ensure our nation's competitive performance in the international workplace. Past alignment with national standards and practices is a reason Minnesota students have done so well on national and international comparisons. Changing the proposed Minnesota Academic Standards for Science to include recommendations from the minority report of the Science Standards Committee will be a disservice to Minnesota's students, and limit Minnesota's scientific and technological competitiveness.

National content standards in mathematics had been published in 1989 by the National Council of Teachers of Mathematics (NCTM), following publication of the seminal report, *Everybody Counts: A report to the nation on the future of mathematics education* (Mathematical Sciences Education Board, National Research Council, 1989). Standards for science education were developed separately by two national organizations—the American Association for the Advancement of Science (AAAS) published its *Benchmarks for Science Literacy* in 1993; the National Research Council (NRC), operating arm of the National Academy of Science, released its *National Science Education Standards* in 1996.

The NCTM and NRC standards documents became keystone documents guiding the vision of the founders of SciMathMN and are directly referenced in SciMathMN's strategic plan for 2000-2005.

Minority Report The minority report, signed by only four members of the Science Standards Committee, asserts that students have the right to learn about evolution within the context of the other competing theories. This assertion appeals to our shared democratic ideals, but the argument is misleading, because it misconstrues and misrepresents the status of a “theory” in science. The Theory of Evolution is as central to modern biology as the Theory of Plate Tectonics is to geology, and as the Theory of Relativity is to physics. Evolution, Plate Tectonics and Relativity are considered scientific theories because their principles have withstood countless tests of validity through experiments using multiple working hypotheses, as is required by the scientific method. There are simply no scientifically sound competing theories to the theory of evolution today.

No small part of the evolution controversy stems from differences in the everyday use of the word “theory” by scientists and non-scientists. Outside of the scientific community, the word “theory” is used the same way scientists use the word, “hypothesis”, but for scientists, a theory is a concept that is upheld in countless scientific tests and explains observed phenomena. A scientist doesn't start from scratch; instead, s/he begins with an understanding of the accepted science, and works from there. The Theory of Evolution was a necessary precursor to the science of heredity, which in turn has led us to the modern promise of biotechnology, including life-saving gene therapies. In biology, there is no other analytical base that can explain our observations and guide biological research other than Theory of Evolution. Teaching our students otherwise leaves them insufficiently prepared in knowing the main ideas of science.

What's at Stake

Students need a science education well-grounded in the important ideas of science to build their personal capacity to succeed and to contribute to our state's workforce. A workforce lacking a strong understanding of the key ideas in science will weaken Minnesota businesses and industries and contribute to the waning of US's role as an international leader in science and technology.

Our state's economic security will be seriously compromised if the rigorous science education standards drafted by the full Minnesota's Science Standards Committee are not approved by the legislature. Four years ago, when Kansas removed the topic of evolution from their science standards, the Oregon software company, Broadcast Software International, responded by immediately rejecting Topeka as a site for the new regional technical center. According to the firm's president, Ron Burley, at issue was not only whether they could count on a good selection of well-educated future employees in the area, but also their image as a business at the forefront of technology. Such concerns are particularly immediate and relevant as Minnesota recently launched a high-profile initiative to attract biotechnology firms to the state—an industry representing the cutting edge of biological science.

Will Minnesota continue to serve as a national role model for science education programs around the country? Or will the legislature opt for a lesser future, denying

our students the science standards that ensure their competitiveness in an increasingly scientific and technological society? The SciMath^{MN} Board of Directors encourages the legislature to adopt the Academic Standards for Science developed by members of the full Science Standards Committee. It is a strong guarantee that Minnesota students will have a sound learning of important science.

Contact

Nancy Nutting
Executive Director
651-221-2590
info@scimathmn.org

Russanne Low, PhD.
Executive Committee
303-497-2657
rlow@ucar.edu
