AMERICAN MUSEUM OF NATURAL HISTORY

SCIENCE GENERATION
A National Imperative

Curated Bibliography of Science Education Resources

Communications		
State of Science	Chicago Museum of Science and Industry, 2008	The Chicago Museum of Science and Industry and Harris Interactive released a poll about American's views of science and science education. Topics include American's view of the role and quality of science, the quality of science education, and the scientists as role models.
America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science (COMPETES) Act	121 STAT. 600 PUBLIC LAW 110–69—AUG. 9, 2007	Both the U.S. House and Senate passed comprehensive legislation (H.R. 2272, S. 761) to ensure our nation's competitive position in the world through improvements to math and science education and a strong commitment to research.
Math + Science = Success Campaign	University of Georgia System, 2008	The Georgia Partnership for Reform in Science and Mathematics (PRISM) is an initiative funded by the National Science Foundation. The goal is to help all of our state's children prepare for future success by improving their math and science skills.
Important but Not for Me	Public Agenda, 2007	There is growing consensus among the nation's business, government and higher education leaders that unless schools do more to train and nurture a whole new generation of young Americans with strong skills in math, science and technology, U.S. leadership in the world economy is at risk. But our new report concludes that Kansas and Missouri parents and students didn't get the memo.

Words That Work-Innovation America	National Governors Association, 2007	To help gauge Americans' attitudes on the topic of innovation, the National Governors Association (NGA) engaged the services of noted researcher Dr. Frank Luntz, chairman and CEO of Luntz, Maslansky Strategic Research.
Summary and Indicator Reports		
A Summary of Math and Science Education and United States Competitiveness: Does the Public Care?	Solutions for our Future, 2006	The competitiveness of the United States in the global economy has been the backbone for concern about math and science education and the move to improve public school education to gain higher levels of proficiency in those areas. This study investigates public opinion and college and university roles around expectations about the United States' ability to maintain its competitive edge in the global environment. It provides some fascinating views held by the survey respondents, such as the biggest reason for students' avoidance of math and science is level of difficulty.
PISA 2006 Science Competencies for Tomorrow's World	OECD Programme for International Student Assessment, 2006	PISA 2006: Science Competencies for Tomorrow's World presents the results from the most recent PISA survey, which focused on science and also assessed mathematics and reading. It is divided into two volumes.
2005 NAEP Science Results	The Nation's Report Card, 2005	Compared to middle and high school students, younger students are making the most progress in science. In 2005, a representative sample of more than 300,000 students in grades 4, 8, and 12 were assessed in science. This website presents national results for all three grades, and state results for grades 4 and 8.
Science and Engineering Indicators 2008	The National Science Foundation, 2008	This overview of the National Science Board's Science and Engineering Indicators 2008 describes some major developments in international and U.S. science and technology (S&T). It synthesizes selected major findings in a meaningful way and is not intended to be comprehensive.

Best Practices		
Building a STEM Education Agenda	National Governors Association, 2007	Building a STEM Agenda recommends state-level policies to help states build a coherent K-12 STEM education system. It links closely to NGA's Innovation America Initiative.
NOAA's Strategic Plan for Education	National Oceanic and Atmospheric Administration, 2004	NOAA's Plan for Education outlines the vision and scope necessary to address exponential increases in our society's information needs and bring NOAA data and information to all learners.
A Compendium of Best Practice K-12 STEM Education Programs	Bayer Corporation, 2006	This compendium offers a sampling of some of the country's exemplary programs that have a track record of helping students, especially girls and minorities, to achieve and participate in STEM.
Council of Chief State School Officers Math and Science Education Task Force	Council of Chief State School Officers, 2007	The CCSSO Mathematics and Science Education Task Force convened to address a common set of concerns regarding the condition of mathematics and science education in the United States.
National Reports		
Rising Above The Gathering Storm: Energizing and Employing America for a Brighter Economic Future	The National Academies, 2005	This is a comprehensive report that addresses the continuing concerns associated with international competitiveness and the American education system.
A National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics Education System	The National Science Foundation, 2007	In this action plan the National Science Board - established by Congress in 1950 - identifies priority actions that should be taken by all stakeholders, working together cooperatively, to achieve measurable improvements in the nation's STEM education system.
America's Perfect Storm: Three Forces Changing Our Nation's Future	Educational Testing Service, January 2007	The confluence of three powerful forces, according to this report, will lead to greater inequity and polarization within the U.S. or to an opportunity for continued prosperity. The forces include: 1) a wide disparity in literacy and numeracy skills among school-age and adult populations; 2) a changing and more global economy; and 3) a growing and more diverse population.

Report of the Academic Competitiveness Council	US Department of Education, 2007	This report presents the findings and recommendations of the Academic Competitiveness Council. The Council carried out a year-long effort with officials from federal agencies to assess programs aimed at improving America's competitiveness in science, technology, engineering and mathematics.
S&E Doctorates Hit All-Time High in 2005	National Science Foundation, 2006	In 2005, total doctorate awards in science and engineering (S&E) increased for the third year in a row, up to 27,974, surpassing the previous all-time high from 1998 (27,273). Several demographic groups (women, non-U.S. citizens and U.S. citizen Asians, and underrepresented minorities) also received record numbers of S&E doctorates in 2005. Post-9/11, there is little evidence of a decline in the number of or growth in noncitizens earning S&E doctorates from U.S. institutions. There was a slight drop in 2002, but that was also true for U.S. citizens. For the entire period from 2001 to 2005, S&E doctorates awarded to noncitizens increased by 25% and accounted for virtually all of the overall growth in S&E doctorate awards during the period.
To Recruit and Advance: Women Students and Faculty in Science and Engineering	National Academies of Science, 2006	Although more women than men participate in higher education in the United States, the same is not true when it comes to pursuing careers in science and engineering. This report identifies and discusses better practices for recruitment, retention, and promotion for women scientists and engineers in academia. It examines: (1) recruitment of female undergraduates and graduate students; (2) ways of reducing attrition in science and engineering degree programs in the early undergraduate years; (3) improving retention rates of women at critical transition points – from undergraduate to graduate student, from graduate student to postdoc, from postdoc to first faculty position; (4) recruitment of women for tenure-track positions; (5) increasing the tenure rate for women faculty; and (6) increasing the number of women in administrative positions.
Framework for Evaluating Impacts of ISE Projects Report from a National Science Foundation Workshop	National Science Foundation, 2008	Explains the origins of this book in the National Science Foundation's work to advance the informal science education field as a whole, then overviews impact evaluation and at some of the common issues, concerns, and opportunities in evaluation practice

Revolutionizing Earth System Science Education for the 21st Century: Report and Recommendations from a 50-State Analysis of Earth Science Education	TERC, 2007	This study, conducted by TERC on behalf of NOAA's Office of Education, analyzed K-12 Earth science standards and frameworks of all fifty states, plus the District of Columbia, to determine how well each state's standards address Earth science content and pedagogical criteria.
Climate Literacy The Essential Principles of Climate Sciences K-12	NOAA Climate Program Office, 2008	This Climate-oriented guide to teaching science standards was developed with input from recent workshops and discussions and reflects the current efforts in defining climate literacy. In part, it is modeled after the work conducted by American Association for the Advancement of Science (AAAS) Project 2061, federal science agencies, educators, and other organizations' efforts to identify essential principles and fundamental concepts for Ocean Literacy and related work in other areas of Earth systems science education.
Teaching and Learning		
Scaling Up Instructional Improvement Through Teacher Professional Development: Insights From the Local Systemic Change Initiative	Iris R. Weiss and Joan D. Pasley, Consortium for Policy Research in Education, March 2006	There is a widespread view in the research and policy communities that the quality of mathematics and science instruction offered to students in the United States is low. The results of the Trends in International Mathematics and Science Study suggest that the reasons for American students' poor performance in mathematics and science are complex, but at least partly due to weaknesses in the knowledge and skills of those teaching the subjects. In order to enhance teaching in these content areas, states and school districts need to act on what research has discovered about professional development and instructional improvement. This brief shares results from a major professional development effort that extends current understanding of what is entailed in creating improvements at scale.
Before It's Too Late: A Report to the Nation from The National Commission on Mathematics and Science Teaching for the 21st Century	The National Commission on Mathematics and Science Teaching for the 21st Century, 2000	The National Commission on Mathematics and Science Teaching for the 21st Century released a comprehensive plan to ensure that every American student receives excellent instruction in math and science — instruction critical to maintaining the U.S. edge in the competitive global economy. The report emphasizes that good teaching is key to improved student achievement.

Transforming the Recruitment, Retention, and Renewal Of Our Nation's Mathematics and Science Teaching Workforce	Business Higher Education Forum, 2007	This report addresses the critical shortage of high quality mathematics and science teachers, the lack of which threatens the strength, innovation and productivity of America's economy. The report proposes a comprehensive action plan to elevate the status of the teaching profession and focuses on transforming three key components that contribute to a robust, world-class teaching workforce: recruitment, retention and renewal.
Engaging Students by Using Engineering and Technology in Mathematics, Science and Career/Technical Classrooms	Southern Regional Education Board, November 2005	This two-page brief argues that incorporating real-world engineering and technology applications into mathematics, science, and career/technical instruction is important for the following reasons: (1) technological literacy is a basic literacy for the 21st Century; (2) technology makes mathematics and science relevant, answering the question "Why do we have to learn this?"; (3) students develop problem solving, critical and creative thinking, and data analysis skills essential to success in a high-performance workplace; and (4) more students are encouraged to enter the field of engineering.