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## SCIENCE LEADERS CITE A "CHANGED WORLD" IN CALL FOR BOLD EFFORTS TO IMPROVE K-12 SCIENCE AND MATHEMATICS EDUCATION

Citing a "changed world" in the global picture for science and technology(S&T), the National Science Board has released its biennial report to the President, Congress, and the nation, Science and Engineering (S&E) Indicators 2006. In doing so, members of the board appearing in a Capitol Hill briefing said that the growing international competition in S&T, previously expressed in terms of "potential," has now become "reality." Against this backdrop, the panelists expressed concern that today's K-12 students in science and mathematics are not improving their learning relative to international peers, boding a potential loss for the United States of its global prominence in discovery and innovation. "It's in the next decade that we have some real issues to confront, especially in our education system, if we are to maintain our world leadership in discovery, innovation, and national security," said Steven C. Beering, Ph.D., who heads the Science Board's Subcommittee on Science and Engineering Indicators. Beering said that while the new S&E Indicators concludes that the United States still maintains its very strong global position in research and innovation, he was also concerned over the nation's future ability to keep up with the global enterprise because of continued inconsistency in the performance of U.S. students in K-12 science and mathematics.

Board members, 24 in all, consisting of some of the nation's preeminent scientists, engineers, and educators, were especially vocal in their policy report, America's Pressing Challenge – Building a Stronger Foundation, released simultaneously with S&E Indicators. The recommendations of the board's report were numerous, but a few directed emphasis to specific areas, such as encouraging higher education leaders to strengthen K-8 teacher education programs to reach the youngest students with enhanced content knowledge to keep students' interest. Board members also said that equal time, in K-8 classrooms especially, should be devoted to science, math, and reading during the school day. The board recommends that resources be used to properly compensate teachers comparably to similarly trained science and engineering professionals in other sectors.

Teachers also need to have many more opportunities for summertime experiences working with scientists on inquiry-based projects that will help teachers transfer practical knowledge of the scientific process to their students, it said.

In other findings of S&E Indicators, U.S. national research and development declined in 2002 for the first time in 50 years, but rebounded in 2003. The 2002 slowdown had some impact on unemployment among scientists and engineers, which reached 4.6 percent in 2003, but economic recovery brought that number back down significantly in 2004. Indicators 2006 also reports that

the number of science and engineering degrees awarded at all levels is rising, especially bachelor's and master's degrees. Graduate enrollments also are on an upward course across all major U.S. demographic groups, and this occurred despite lowering enrollment numbers of foreign-born students. The National Science Board is an independent 24-member body of advisors to the President and Congress on matters of national science and engineering policy. S&E Indicators is updated every two years so that the NSB can advise the President on the current status of the nation's science and engineering enterprise. The board is also the policy making and oversight body for Triangle Coalition member, the National Science Foundation (NSF) -- the independent federal agency that supports almost all areas of fundamental research conducted nationwide.

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### ELEVEN SCHOOLS WIN MERCK/AAAS UNDERGRADUATE SCIENCE RESEARCH PROGRAM AWARDS

Eleven U.S. colleges and universities are winners of the 2006 awards for the Merck/AAAS Undergraduate Science Research Program, sponsored by Triangle Coalition member, the Merck Institute for Science Education, and the American Association for the Advancement of Science (AAAS). Each award provides up to \$60,000 for joint use by the biology and chemistry departments at each recipient institution. The Undergraduate Science Research Program is a national competitive awards program available in all 50 states, the District of Columbia, and Puerto Rico. Up to 15 awards are made annually. The funding supports research stipends for undergraduate students and ancillary programs that foster interactions between the biology and chemistry departments. Launched in 2000 as a national competition, awards will be made through 2009. This 10-year, \$9 million initiative is funded by the Merck Institute for Science Education and administered by AAAS. Its goals are to enhance undergraduate education through research experiences that emphasize the interrelationship between chemistry and biology, encourage students to pursue graduate education in chemistry and life sciences, and foster undergraduate programs and activities that bridge chemistry and biology.

The Merck Institute for Science Education is a tax-exempt private foundation established in 1993 to improve science education in the public schools. Now expanded to include college and graduate-level education, MISE works to build capacity in the biomedical sciences through partnerships with education institutions. The American Association for the Advancement of Science is the world's largest general scientific society; it serves 262 affiliated societies and academies of science, reaching 10 million individuals.

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### TIMOTHY MAGNER NAMED HEAD OF EDUCATIONAL TECHNOLOGY OFFICE

U.S. Secretary of Education Margaret Spellings has announced the appointment of Timothy J. Magner as director of the Office of Educational Technology(OET). As director, Magner will coordinate the development and implementation of the Department's educational technology policies. OET's main goal is to maximize technology's contribution to improving education.

OET develops national educational technology policy and implements that policy department-wide, supporting the goals of No Child Left Behind and other initiatives.

Magner returns to the Department after serving as deputy executive director for technology at the Council of Chief State School Officers. Prior to that he served as the Department's deputy director for educational technology, from April 2004 to June 2005. Magner holds a Bachelor of Arts in Government from The College of William and Mary and a Masters in Education from Harvard University. For more information about OET, visit [www.ed.gov/about/offices/list/os/technology](http://www.ed.gov/about/offices/list/os/technology).

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### STUDY FINDS STRONG LINK BETWEEN CHALLENGING STUDIES AND DEGREE COMPLETION

Completing academically challenging course work in high school dramatically increases the likelihood of a student earning a bachelor's degree, according to a study recently released by the U.S. Department of Education. "The Toolbox Revisited: Paths to Degree Completion From High School Through College," found that the academic intensity of a high school curriculum is the strongest indicator of postsecondary degree completion, regardless of a student's major course of study. The Toolbox Revisited studies the High School Class of 1992 as it moved from high school to higher education and includes comparisons to a previous report, "Answers in the Tool Box," which followed the High School Class of 1982 from high school through college. Both national longitudinal studies had similar findings. "This new data empirically confirms what educators already know: Challenging high school course work prepares students for the much tougher challenges that lie ahead," said Secretary Spellings. "It also helps colleges and universities by reducing the need for costly remedial education." Through high school and college transcripts, the study examines students who attended a four-year college at any time, including students who started out in community colleges. The data on which the study is based cover a period of eight and a half years for degree completion -- from high school graduation in spring 1992 until December 2000. It is based on data from the National Education Longitudinal Study of 1988.

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### "LIVING IN A MATERIAL WORLD" GRANTS FOR K-12 TEACHERS

The ASM International Foundation is sponsoring "Living in a Material World" \$500 grants for K-12 teachers to enhance awareness of materials science and the role of materials scientists in society. Interested applicants may submit a two-page proposal describing a curriculum based hands-on project, involving student observation, communication, and mathematics and science skills while enhancing their awareness of the materials around them. A one-page summary report will be required of winning proposals. According to Triangle Coalition member, the Sloan Career Cornerstone Center, materials science and engineering is a field of engineering that encompasses the spectrum of materials types and how to use them in manufacturing. Materials span the range: metals, ceramics, polymers(plastics), semiconductors, and combinations of

materials called composites. Everything we see and use is made of materials: cars, airplanes, computers, refrigerators, microwave ovens, TVs, dishes, silverware, athletic equipment of all types, DVDs, and biomedical devices such as replacement joints and limbs. Although the field deals with materials, it encompasses an incredible diversity of topics and problems constituting the four elements of the field -- processing, structure, properties, and performance. Interested teachers are encouraged to contact local ASM members for assistance. Original, imaginative projects other teachers will want to emulate are encouraged. More details on the "Living in a Material World" grants are available online.

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## TWENTY STATES ASK FOR FLEXIBILITY IN SCHOOL LAW

(Source: New York Times, February 22, 2006)

The federal Education Department has agreed to review requests from 20 states to alter significantly the way they measure student progress under the No Child Left Behind Act. The move comes as the number of schools across the country deemed substandard under that law grows by the thousands. The requests, which Education Secretary Margaret Spellings invited states to submit last November as part of a pilot project, would allow states to judge schools by tracking the progress of individual students over time. Currently, schools must show improvement in successive grades of students, with more of this year's fifth graders, for example, proficient at reading and math compared with last year's fifth graders. States have long sought such a change, contending that it is fairer to measure the improvement in individual students than in different groups of students. The states that have applied to make the changes for the current school year are Alaska, Arkansas, Arizona, Colorado, Delaware, Florida, Hawaii, Indiana, Iowa, North Carolina, Oregon, South Carolina, Tennessee, and Utah.

Six more -- Maryland, Nevada, New Hampshire, Ohio, Pennsylvania, and South Dakota -- have asked to apply changes next year. Only 10 states will be permitted to make the changes in assessing this year's test results. The plans must still be reviewed by a government-appointed panel and receive approval from federal officials, expected by May, to move forward. The department's willingness to consider the requests is the most recent in a series of steps Ms. Spellings has offered, amid growing legal and political challenges to the law, to give states more flexibility in complying with it.

Under the outlines they submitted, many states are also suggesting that they be permitted to count students as proficient in reading or math even if they are not, so long as they are on track to reach proficiency within two, three or four years, depending on the proposal.

(Editor's Note: For more information on the No Child Left Behind Act, visit [www.ed.gov/nclb](http://www.ed.gov/nclb).)

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## APPROACH TO SCHOOL AFFECTS HOW GIRLS COMPARE WITH BOYS IN MATH

More women are pursuing higher education and doctoral degrees than ever before, but women

still are rare in the math-oriented professions. Yet, researchers say, girls perform just as well as boys on achievement tests and tend to earn better grades in math than do boys during the earlier school years. A new study in the journal *Developmental Psychology* indicates that how girls and boys approach their schooling underlies the differences in math grades. It also suggests that although the girls' approach to school may give them an edge in the grades they earn in math, it may not buy them much when it comes to math scores on achievement tests because girls are less confident than the boys about their skills in math. The study examined 518 boys and girls as they went through fifth and seventh grades in three primarily white, middle- to upper-class school districts in Illinois. Using children's reports, researchers looked at how the children approached their schoolwork, including their goals and in-class behavior. The children also reported on how confident they were about their ability to do well in math. Researchers also reviewed the young students' grades and achievement test scores in math.

Girls consistently used these learning strategies more than the boys did, the researchers found. It appears that, in contrast to boys, girls are more concerned with learning than with outperforming their classmates. They also engaged in less disruptive classroom behavior. As a consequence, girls used more focused learning strategies, giving them an edge over boys in terms of grades. At achievement test time, however, girls' lost their advantage in math; their scores were the same as those of boys. After examining various factors, what stood out was children's confidence in their ability to do well in math. The Chicago-based Spencer Foundation partially funded the study.

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## TRIANGLE COALITION AND NASSMC TO CO-HOST ONE DAY SYMPOSIUM

Triangle Coalition and the National Alliance of State Science and Mathematics Coalitions (NASSMC) are co-hosting a one day symposium on the issues surrounding education and competitiveness in response to the President's recent call for the establishment of an American Competitiveness Initiative in Education.

Topics to be covered include the recent reports "Rising Above the Gathering Storm"(National Academies) and "Tapping American's Potential"(The Business Roundtable), as well as the Administration's response to the call for increased focus on STEM education.

Speakers will include John Castellani, President of The Business Roundtable; Dr. Ray Simon, Deputy Secretary of Education; and Dr. John Marburger, Science Advisor to the President and Director of the Office of Science and Technology Policy. The symposium will run from 1:00-4:00 p.m. on Wednesday March 29th at the Hilton Mark Center Hotel in Alexandria, Virginia. Space is limited and available on a first come first serve basis. If you would like to attend the symposium, please contact Debbie Murray, Triangle Coalition, [murrayd@triangle-coalition.org](mailto:murrayd@triangle-coalition.org). Although there is no charge for this event, you must register to attend.

The symposium is being held in conjunction with the Triangle Coalition's legislative update conference, "Education and Innovation - Competitiveness in a Global Marketplace." Conference participants will be introduced to current and pending legislation, as well as funding issues

surrounding STEM Education for the upcoming fiscal year. For additional information about the conference and to register please visit the Triangle Coalition website at [www.trianglecoalition.org/conf.htm](http://www.trianglecoalition.org/conf.htm).

## PANEL REVIEWS A DECADE OF MATH AND SCIENCE EDUCATION REFORM

After ten years of observing and interviewing teachers of science, mathematics, and technology, Horizon Research, Inc. of Chapel Hill, NC, is releasing "Lessons from a Decade of Mathematics and Science Reform," the first comprehensive evaluation of the National Science Foundation's \$250 million investment in the Local Systemic Change through Teacher Enhancement Initiative (LSC). As its name suggests, the LSC program seeks to improve science and mathematics education by providing in-depth, content-specific professional development to large numbers of teachers. Since its launch in 1995, a total of 88 LSC projects have been implemented in 31 states, providing professional development to 70,000 teachers in 4,000 schools in 467 urban, rural, and suburban districts. The payoff, as detailed in the report, is an improved quality of mathematics and science lessons in grades K-12. Moreover, many of the successful projects have become models for sustainable, ongoing programs. For more information, visit [www.nsf.gov](http://www.nsf.gov).

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## BREAKING RANKS IN THE MIDDLE

A new report released by the National Association of Secondary School Principals (NASSP) entitled "Breaking Ranks in the Middle: Strategies for Leading Middle Level Reform" challenges middle level principals to take responsibility for improving the academic outcomes of all of their students and for getting them on track for success in high school and beyond. The report -- which was developed in collaboration with the Education Alliance at Brown University and a commission of middle level practitioners and experts -- details nine strategies and 30 specific recommendations for improving student achievement. It includes four full-length profiles and a number of vignettes of schools that put the report's recommendations into action. Policymakers and the business community alike have pushed for reforms for America's high schools. "The early warning signals for high school drop-outs and low-achieving students can be seen at the middle level," said Gerald Tirozzi, NASSP Executive Director. "Collaborative leadership, data, personalized learning, and a rigorous curriculum at the middle level will better prepare students for high school and post-secondary success," he added.

The ultimate goal of "Breaking Ranks in the Middle" is to move from isolated, often profiled, model high-performing schools to an entire system of excellent schools benefiting all students. "Breaking Ranks in the Middle" proposes strategies that are applicable to all types of schools -- big or small, urban, suburban, or rural. The nine strategies are concentrated in three key areas: (1) collaborative leadership, professional learning communities, and the strategic use of data; (2) personalizing the school environment; and (3) creating rigorous student-centered curriculum, instruction, and assessment. More information can be found at [www.principals.org](http://www.principals.org).

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## SECRETARY SPELLINGS ANNOUNCES NATIONAL MATH AND SCIENCE SUMMIT FOR GIRLS AND DISCUSSES AMERICAN COMPETITIVENESS

U.S. Secretary of Education Margaret Spellings recently addressed board chairs, chief executive officers, and local council leaders at a meeting of the Girl Scouts of the USA. She announced that the Department of Education's first-ever national summit for girls on math and science would take place later in 2006. As part of her prepared remarks, Spellings said "we will bring together our best and brightest women leaders to develop a national strategy to help more girls -- and their parents -- get excited about math and science." She indicated that some of the participants will include Sally Ride, the first American woman in space, Julie Gerberding, who heads the Centers for Disease Control, and Kathie Olsen, from the National Science Foundation, who's a former Chief Scientist at NASA. "I look forward to collecting these leaders under one roof so that we can set the stage for long-term action on a national level," Spellings explained. "When educators get together with women astronauts, scientists, engineers, business leaders, and of course, the Girl Scouts...it all adds up to higher achievement for girls...and for our nation."

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## BUSINESS CAMPAIGN LAUNCHES WEBSITE TO PROMOTE MATH AND SCIENCE REFORM INITIATIVE

The Tapping America's Potential("TAP") campaign has launched [www.tap2015.org](http://www.tap2015.org), a website designed by the business community to make improving the U.S. math and science talent pipeline a national priority as a key component of U.S. competitiveness. The fifteen business organizations that comprise TAP represent every sector of the U.S. economy and include America's largest and most innovative companies. The site provides national and international data -- including state-specific information -- drawing a clear picture of the competitiveness challenges facing our country. Also included are links to key reports, news coverage of the issue, and the results of public opinion research on competitiveness and innovation conducted in the second half of 2005. In addition, the site offers information on how everyone -- businesses, policymakers, employees, parents, educators, and students -- can join the campaign and play a part in achieving the TAP goal.

The "Tapping America's Potential" report, released in July 2005, expressed deep concern about America's ability to sustain its scientific and technological superiority. The report set the goal of doubling the number of U.S. science, technology, engineering, and mathematics graduates with bachelor's degrees by 2015. Since that time, the National Academy of Sciences has released its own report echoing many of the same concerns, the President has called for an American Competitiveness Initiative, and several pieces of bipartisan legislation have been introduced in Congress. The TAP website is designed to add to this building momentum. After issuing its report in July 2005, TAP mobilized an intensive effort to vocalize concerns at the highest levels of Congress and the administration. TAP members are encouraging policymakers to pass legislation this year to address the current and growing need to strengthen U.S. capabilities in science, technology, engineering, and mathematics.

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## PLAN TO ZERO OUT U.S. TECHNOLOGY GRANTS DRAWS FIRE

(Source: Education Week, March 1, 2006)

A \$272 million program to help states and school districts use technology for education would be axed under President Bush's fiscal 2007 budget, partly because the White House says it lacks rigorous data on its effectiveness. But education groups defending the Enhancing Education Through Technology (EETT) program argue that the administration would get the information it needs, if only it would await the results of three ongoing federal studies costing millions of dollars, the first of which began in 2001. "That's a waste of the time and resources that have gone into setting up these scientifically based research grants," said Melinda G. George, the executive director of the State Education Technology Directors Association, based in Arlington, VA.

The association is part of a coalition of groups pushing Congress to preserve the EETT grant program, sometimes known as E2T2. Created as part of the 4-year-old No Child Left Behind Act, the program distributes money both through a formula that favors disadvantaged students and through a competitive-grant process overseen by states. Projects supported by EETT run a huge gamut, from creating digital curriculum content to supporting teacher training in the use of technology and its integration into lessons. The money is tapped to involve parents through technology, to use data in decisionmaking, and to assess student learning by computer or online.

Timothy J. Magner, the newly appointed director of the U.S. Department of Education's office of educational technology, said last week that the effectiveness of the EETT grants should be judged through an "outcomes-based evaluation rather than anecdote." "I certainly don't want to pre-empt that (research) in any way," he said. "We'll reserve judgment for effectiveness when we look at those (studies)". Still, he said, the administration's proposal to eliminate the program was "a question of prioritizing resources," especially in light of strains on the federal treasury from the war in Iraq and the costs of Hurricanes Katrina and Rita.

(Editor's Note: For more information on the Enhancing Education Through Technology program, visit [www.ed.gov/programs/edtech](http://www.ed.gov/programs/edtech).)

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## STATE-BY-STATE LOOK AT STUDENT ACHIEVEMENT PATTERNS

One year after the nation's governors pledged to improve American high schools, most states have made progress in raising achievement in the elementary grades, but secondary schools still struggle to close gaps between poor and minority students and their white or more affluent peers, according to a report recently released by the Education Trust. The report, "Primary Progress, Secondary Challenge: A State-by-State Look at Student Achievement Patterns," examines state assessment results in reading and math between 2003 and 2005 and finds that progress in raising achievement and closing gaps continues to be strongest in the elementary grades. Overall achievement in middle and high school has improved somewhat. But, four years after enactment

of the No Child Left Behind law, there is still too little progress in narrowing gaps between groups in the secondary grades. The Latino-White gap in math achievement at the high school level, for instance, widened or stayed the same in as many states as it narrowed. The report highlights strategies already underway at some high schools that are seeing success in raising achievement for previously low-performing students. They include: improving literacy instruction, assigning all students to challenging courses, and focusing on students' needs to drive teacher assignment and support.

The analysis also raises questions about the rigor of state tests and standards, putting a spotlight on the huge disparities in student performance on state tests and on the National Assessment of Educational Progress(NAEP). Just 29 percent of the nation's eighth-graders demonstrate proficiency in reading and math on federal NAEP assessments. But most states report much higher proficiency rates on their own tests. The report provides a 50-state look at student performance on both tests.

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#### SOLIDWORKS CORPORATION OFFERS NEW TECHNOLOGY SOFTWARE GRANTS FOR TEACHERS

SolidWorks Corporation has announced it would grant SolidWorks Student Edition CAD software to as many as 1,000 individual U.S. educators in a new initiative aimed at improving students' math skills and their interest in technology-related careers. The SolidWorks-STEM Educators grant includes training and lesson plans to help teachers and faculty from middle school through college integrate the four separate disciplines (science, technology, engineering, and mathematics) for more effective education. The SolidWorks-STEM Educators grant includes software, an online course, tutorials, access to a community website, and online symposia. After completing the online course, teachers must demonstrate their competency by producing a short STEM lesson for the classroom that will be shared on the SolidWorks Teacher Community. SolidWorks will then provide an electronic certificate to the teacher documenting 30 hours of professional development work. High school through university level educators may apply before April 1, 2006 at [www.solidworks.com/stemgrant](http://www.solidworks.com/stemgrant). Grants will be awarded in May and June 2006, and assignments must be completed during the summer of 2006.

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#### JWOD/JETS NATIONAL ENGINEERING DESIGN CHALLENGE FINALISTS

NISH-Creating Employment Opportunities for People with Severe Disabilities and Triangle Coalition member, JETS, the Junior Engineering Technical Society, has announced Gulliver Preparatory of Pinecrest, FL, as the first place winner of the first annual JWOD/JETS National Engineering Design Challenge(NEDC). Gulliver's winning invention, the "Simple Electronic Ergonomic Box Opener," will help people with arthritis or carpal tunnel syndrome to open boxes safely by allowing users to open boxes without straining the fingers. The device employs sophisticated electronic components and programming to control the cutting blade and ergonomics concepts in the casing design.

JETS revamped its existing annual design competition this year to reflect a new partnership with NISH and the Javits-Wagner-O'Day(JWOD) Program. The annual JWOD/JETS NEDC challenged students to design and build technological solutions that empower people with disabilities to enter or advance in the workplace.

Leann Yoder, JETS executive director, declared the first joint JWOD/JETS competition a tremendous success. "We couldn't be more pleased with the results of our pilot program for the new NEDC," she said. "It was an exciting event. It's great to see how enthusiastic and engaged all the teams were in learning about engineering, building their prototypes, and presenting them."

The competition provided students an opportunity to apply to real life what they've been learning in the classroom while exploring engineering as a career choice. Students participating in the JWOD/JETS NEDC also learned that technology can increase productivity, boost salaries, and effectively level the playing field for people with disabilities. [Click here](#) for details about the NECD.

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## SCIENCE & ENGINEERING VISUALIZATION CHALLENGE

The National Science Foundation (NSF) and Science Magazine, published by the American Association for the Advancement of Science, are seeking participants for the fourth annual "Science & Engineering Visualization Challenge." The competition recognizes scientists, engineers, visualization specialists, and artists for producing or commissioning innovative work in visual communication.

The ability to convey the essence and excitement of research in digitized images, color diagrams, multimedia, and animation has given researchers the perspective needed to set new research directions and enabled other citizens to see and understand complex science concepts. Award categories include: Photographs, Illustrations, Interactive Media, Non-Interactive Media, and Informational Graphics. Winners in each category will be published in the September 22, 2006 issue of Science Magazine and Science Online and displayed on the NSF website. For more details, [click here](#); the application deadline is May 31.

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## STEM EDUCATORS WITH DISABILITIES SOUGHT FOR NATIONAL WORKPLACE SURVEY

Researchers from Georgia Institute of Technology, in partnership with Triangle Coalition member, the National Science Teachers Association, are conducting a survey to learn about the employment experiences and workplace accommodations used by science, technology, engineering, and math(STEM) K-16 educators with disabilities. The survey is anonymous and takes about 20-30 minutes to complete. The goal of the research is to provide information to help people with disabilities successfully become teachers and to help educators who acquire a

disability to be able to continue in their career. To participate in this National Science Foundation-funded research project, visit [www.catea.org/teachersurvey](http://www.catea.org/teachersurvey).

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## TEN-YEAR STUDY MAPS ROUTE TO QUALITY MATHEMATICS AND SCIENCE TEACHING

Good teaching requires well-prepared teachers. With the nation poised to reinvigorate US achievement in mathematics and science, findings released by Horizon Research, Inc. of Chapel Hill, NC demonstrate that what makes a difference in mathematics and science teaching is ongoing, content-focused professional development. Directed by Dr. Iris Weiss, the Horizon Research, Inc. study examined 88 mathematics and science projects nationwide over a ten-year period. The National Science Foundation funded the projects under the Local Systemic Change Initiatives through Teacher Enhancement program. Rather than offering "one-shot" workshops, Local Systemic Change(LSC) projects engaged teachers in year round, continuing education, which allowed them to develop and apply new knowledge in a supportive school district culture.

The Horizon Research, Inc. study of LSC projects found impacts on teachers and teaching evident after approximately 30 hours of participating in professional development. As a result of the programs which included training in the implementation of district-designated instructional materials:

- \* The overall quality of mathematics/science lessons improved, including the quality of content in lessons;
- \* Teachers used more investigative practices and high-quality questioning of content in lessons;
- \* The amount of time spent on science instruction at the elementary level increased; and
- \* Teachers were more likely to use the designated instructional materials.

For more information about findings from the study of Local Systemic Change(LSC) professional development for mathematics and science teachers, visit [www.pdmathsci.net](http://www.pdmathsci.net).

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## CARUS CHEMICAL COMPANY CELEBRATES 90th ANNIVERSARY

Triangle Coalition member, Carus Chemical Company, celebrated its 90th year in business in 2005. The company was founded in 1915 in LaSalle, Illinois on the site where its main manufacturing facility is still located. It is the world's largest manufacturer of permanganate and is the world leader in permanganate and manganese chemistry. The most important uses of Carus products are in environmental applications -- in water purification to improve drinking water quality, in wastewater treatment, and in remediation of contaminated sites. Dr. Edward

Hegeler Carus, Sr. founded Carus Chemical Company in 1915. His son, Blouke Carus, is currently Chairman of Carus Corporation.

A long-term goal of the Carus Chemical Company is to increase the interests of local children in careers in science, technology, and engineering. Carus is involved in SWEPT(Scientific Work Experience Programs for Teachers), and sponsors a summer Science Camp for kids. Along with the SWEPT teachers, Carus employees volunteer to act as guides to help the young campers with experiments and games. Carus Chemical's educational outreach efforts are also aided by the Chemical Educational Foundation, which provides "You Be The Chemist" kits and assists with suggestions for hands-on experiments that teachers can use in the classroom to spark their students' interests in science. In addition to myriad educational and community outreach programs, Carus Chemical employees bring science to local schools through annual Classroom Chemistry demonstrations. Find out more about Carus Chemical and its educational programs at [www.caruschem.com](http://www.caruschem.com).

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#### BUSH MATH-SCIENCE PLAN GETS AIRING ON HILL

(Source: Education Week, March 8, 2006)

Congressional lawmakers and Bush administration officials pushed their separate proposals for improving math and science education last week at a series of mostly harmonious hearings that seemed to underscore their shared thinking on the issue. "We're all on the same train headed in the same direction," Sen. Lamar Alexander, R-Tenn., who has introduced bipartisan legislation on the subject, said Feb. 28, at the first of three hearings on the subject in successive days. Sen. Alexander, the chairman of the Senate Health, Education, Labor, and Pensions Committee's Subcommittee on Education and Early Childhood Development, is the sponsor of the Protecting America's Competitive Edge(PACE) Act. The measure would establish scholarships and other incentives aimed at raising the number of math and science teachers, and building students' interests in those subjects. "There is nothing in the United States Senate that commands such bipartisan support," Sen. Alexander, who served as secretary of education under President George H.W. Bush, added later.

Mr. Alexander and other subcommittee members quizzed Thomas W. Luce III, the Department of Education's assistant secretary for planning, evaluation, and policy development, and, the next day, Henry L. Johnson, the assistant secretary for elementary and secondary education, about the administration's math and science initiative. He also tried to gauge President Bush's appetite for various pieces of the PACE Act. A central piece of the president's plan is an expansion of the Advanced Placement program, a series of college-prep high school courses that provide students with college credit if they achieve a passing score on tests. The New York City-based College Board sponsors the program. Recent nationwide gains in student math scores seemed to dissipate by the time students were reaching middle-school grades on up, Mr. Johnson said at the March 1st hearing.

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## ED SEEKS NOMINATIONS FOR AMERICAN STARS OF TEACHING

The U.S. Department of Education again plans to honor outstanding classroom teachers through the American Stars of Teaching program. The Department of Education's Teacher-to-Teacher Initiative is seeking nominations and information about teachers who are improving student achievement, using innovative strategies in the classroom, and making a difference in the lives of their students.

Teachers across all grade levels and disciplines will be honored this fall as 2006 American Stars of Teaching. Parents, students, colleagues, school administrators, and others can nominate an exemplary teacher who they believe has the qualities to be an American Star of Teaching. One teacher will be recognized from each state. Click here to learn more or nominate a teacher to become an American Star of Teaching. All nominations must be completed by April 15th.

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## TECHNOLOGY HELPS DISABLED KIDS FIND THEIR VOICE

Laptop computers that combine features from popular toys with innovative technology have rapidly accelerated the learning and communication ability of disabled children, Penn State researchers say. The technology could in the future be adapted to victims of major accidents and the elderly as well. According to Janice Light, distinguished professor of communication sciences and disorders at Penn State, more than 2 million Americans are unable to use speech to communicate, and children are a major component of this population. "Kids learn and communicate through speech by trying out new words and forming sentences," says Light. "If they can't do that due to problems such as autism, Down syndrome, and cerebral palsy, then it is going to be difficult to learn how to read and write, make friends, and communicate their needs."

Computer-based technology that provides speech output is increasingly being used to assist such children in communicating but Light feels it has not yet fully served its purpose. "The design of many of these systems is really based on how adults think, and the machines are complicated and children take years learning how to use them," adds Light, who presented her findings in late February at the 2006 annual meeting of the American Association for the Advancement of Science. Light and her colleagues are currently working on a five-year research grant to redesign assistive technology to improve the ability of these children to learn and communicate in a more meaningful way. The key, she says, is to come up with technology that is appealing to children, easy to learn, and simple to operate.

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## NEW ED-TECH CHIEF TOUTS 'SYSTEMIC' APPROACH

(Source: eSchool News, March 9, 2006)

At a time when the need for global competitiveness looms large and the academic performance of the nation's students is fueling policy debates from local school boards to the White House, Tim Magner, Education Secretary Margaret Spellings' choice to head the federal Office of

Educational Technology(OET), believes technology will play an integral role in helping educators prepare students for life and work in the 21st century.

In an interview with eSchool News, Magner said he's looking forward to the challenges -- and opportunities -- that await him in his new role as the country's top educational technology official. A former software executive and Education Department(ED) veteran, Magner talked about the ways in which technology continues to transform education. He also underscored the federal government's commitment to preparing students for success in the global workforce -- this, despite recent budget cuts to critical funding measures such as the Enhancing Education Through Technology(EETT) block-grant program and other federally funded grant initiatives designed to support technology in the nation's schools. "It goes without saying that, personally and professionally, this is an exciting position to be in," Magner said of his new post at the department. "This is an exciting time in education, where we are looking at it really being the backbone of our national effort to be competitive and to create the next generation of entrepreneurs and scientists and teachers that we have in this country."

(Editor's Note: Tim Magner is one of the panelists participating in the Triangle Coalition 2006 Conference.

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## IMPROVING K-12 MATH AND SCIENCE EDUCATION MUST START AT THE UNDERGRADUATE LEVEL, EXPERTS SAY

At a March 15th hearing of the Research Subcommittee of the House Committee on Science, an expert panel of witnesses said that improving undergraduate science, technology, engineering, and mathematics(STEM) education is key to improving science and math education at the K-12 level and to strengthening U.S. competitiveness. The witnesses also advocated for targeted funding from the National Science Foundation(NSF) for undergraduate education programs. The hearing was one in a series of hearings the Science Committee is holding to help guide its development of a legislative package aimed at strengthening U.S. competitiveness. The Committee plans to introduce the legislation in April, and hopes to move the bills to the House floor by May or June.

Several ideas were proposed to strengthen undergraduate STEM education and encourage undergraduate students to pursue teaching careers -- including implementing professional development workshops for professors, junior faculty, and teaching assistants -- and using cognitive and educational research to improve introductory courses in STEM fields to make them more relevant and more accessible for all students. The witnesses were unanimous, though, in recommending increased NSF funding specifically targeted to undergraduate STEM programs. As part of his new American Competitiveness Initiative, President Bush has proposed doubling over the next ten years the budgets of key science agencies, including NSF.

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## A DAY OF INTERNATIONAL SCIENCE EDUCATION

Triangle Coalition member, the National Science Teachers Association (NSTA), has decreed April 6, 2006 to be "International Science Education Day." The date coincides with NSTA's upcoming National Conference on Science Education in Anaheim, CA, April 6-9. Numerous opportunities are scheduled for international visitors to network at the conference with science educators from Europe, Asia, Africa, Australia, and South and North America. Co-sponsored with the International Council of Associations for Science Education(ICASE), the international conference will commence with a panel on "Professional Development: An International Perspective," followed by concurrent sessions focusing on elementary, secondary, and higher education.

The International Science Day assembly recognizes NSTA's increased emphasis on international collaboration in science education. This increased emphasis is a direct result of the recent acceptance of an important task force report calling for improved services to, and increased collaboration with, our international colleagues. For more information about NSTA, visit [www.nsta.org](http://www.nsta.org); for further details about ICASE, visit <http://icase.unl.edu>.

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#### YOUNG SCIENCE INNOVATORS AWARDED \$530,000 AT INTEL SCIENCE TALENT SEARCH

Intel Corporation has awarded Shannon Babb of Highland, UT top honors and a \$100,000 scholarship in the Intel Science Talent Search(STS). Babb, the competition's first Utah winner, will take her place among esteemed alumni that include six Nobel Laureates, three National Medal of Science winners, 10 MacArthur Foundation Fellows, and two Fields Medalists. With a rare ability to combine research and remediation in environmental science, Babb, 18, of American Fork High School, conducted a six-month study to identify water quality problems in the Spanish Fork River. Babb, who started researching water quality at age 13, analyzed the chemical and physical properties along the river drainage system. She concluded that humans, through urban and agricultural factors, have a negative effect on the water quality of the river. She contends that the water quality problem can be resolved with a combination of restructuring and educating the public that household chemicals should not be poured down storm drains. Sponsored by Intel since 1998, the STS is America's oldest high school science competition and is part of the company's \$100 million annual commitment to improving education around the world. In all, 1,558 students entered the competition this year, representing 486 high schools in 44 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and an overseas school.

Students ranged in age from 15 to 18 with females representing 53 percent of the total entrants. From these entries 300 semifinalists were chosen. More than 100 top scientists from a variety of disciplines reviewed all the Intel STS entries to narrow the field to 40 finalists. They examined each individual's research ability, scientific originality, and creative thinking. Triangle Coalition member, Science Service, is the nonprofit organization which has administered the Science Talent Search since its inception in 1942. The mission of Science Service is to advance the understanding and appreciation of science. In addition to its education programs, Science

Service publishes the weekly magazine Science News. For more information on Science Service, visit [www.sciserv.org](http://www.sciserv.org). More details on the STS are at [www.sciserv.org/sts](http://www.sciserv.org/sts).

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## STUDENTS RACE TO THE FUTURE IN NASA'S 13TH ANNUAL GREAT MOONBUGGY RACE

It's not common knowledge, but high school and college students across the country know it is quite possible to ride across the surface of the moon without ever leaving Earth. Fifty-eight high school and college student teams are putting the finishing touches on the designs of their very own lunar vehicles.

Teams from the United States and Puerto Rico are competing in NASA's 13th annual Great Moonbuggy Race. The event is April 7-8 at the U.S. Space & Rocket Center in Huntsville, AL. The race was inspired by the lunar rover vehicles astronauts drove on the moon during three Apollo missions. Students will race their human-powered vehicles in time trials across a simulated moon surface.

Teams have spent countless hours working on their designs. They had to find parts, manufacture, and fine-tune their vehicles to ensure they survive the rough terrain of the race's half-mile obstacle course. Along the way, students learned valuable lessons about teamwork, engineering, and overcoming challenges to reach their goals. "The competition draws the next generation of scientists and engineers," said Jim Ellis, manager of the Academic Affairs Office at NASA's Marshall Space Flight Center in Huntsville, AL. "The lessons they learn here can be carried on into their future studies and eventually to their careers. These students may become our next explorers, carrying out NASA's Vision for Space Exploration to return to the moon and travel to Mars," he added. The first Great Moonbuggy Race was run in 1994. It commemorated the 25th anniversary of the Apollo 11 lunar landing. Eight college teams participated that first year, and in 1996 the race was expanded to include high school teams. For the 13th running of the race this year, 58 teams will rumble across the simulated lunar surface. For more event details, race rules, information on the course and photos from previous competitions, visit <http://moonbuggy.msfc.nasa.gov>. For information about Triangle Coalition member, NASA, and its education programs, visit <http://education.nasa.gov>.

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## NEARLY 23,000 TEACHERS PARTICIPATE IN TI EDUCATION PROGRAM

Nearly 23,000 educators are championing a math revolution aimed at getting U.S. middle and high school students more interested in mathematics. Challenging the student perception that math is boring or irrelevant; teachers are combining education with popular entertainment to show students that "We All Use Math Every Day." Triangle Coalition member, Texas Instruments(TI), in partnership with CBS, launched this unique education initiative based on the TV series "NUMB3RS" to support teachers, motivate students, and raise awareness of the many

uses of mathematics in everyday life. The program launched last fall and includes a student sweepstakes with extra credit math questions, cast events at key educational trade shows, classroom materials, and weekly math activities.

The weekly math activities for grades 8-12, jointly developed by TI and Triangle Coalition member, the National Council of Teachers of Mathematics (NCTM), correspond with each episode of the show. The engaging activities allow students to more deeply explore the math derived directly from the concepts highlighted in each "NUMB3RS" episode. The activities are available for download online.

Educational & Productivity Solutions, a business of Texas Instruments, provides a wide range of advanced tools connecting the classroom experience with real-world applications and enabling students and teachers to explore math and science interactively. For more than 15 years, TI has worked closely with educators and administrators to develop student-focused curricular and supplemental classroom materials, and it supports the world's largest professional development organization for the appropriate use of educational technology. More information is available at [www.education.ti.com](http://www.education.ti.com). The National Council of Teachers of Mathematics is a public voice of mathematics education, providing vision, leadership, and professional development to support teachers in ensuring mathematics learning of the highest quality for all students. With 100,000 members and 240 Affiliates, NCTM is the world's largest organization dedicated to improving mathematics education in prekindergarten through grade 12. More information is available at [www.nctm.org](http://www.nctm.org).

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## SWE SURVEY REVEALS GAP BETWEEN AGENDA FOR FOSTERING ENGINEERING TALENT AND ABILITY TO DIVERSIFY THE FIELD

The need for the United States to build a new generation of leaders proficient in science, technology, engineering, and math is at the top of the nation's agenda. While encouraging all young people to take more math and science classes and pursue careers in related fields is critical, this initiative has even greater significance among the nation's young women. Less than 10 percent of American engineers today are women. According to survey results recently released today by the Society of Women Engineers (SWE), 75 percent of girls surveyed do not plan on pursuing a career in science, math, or technology -- and only 10 percent of those surveyed have considered engineering as a future career option. In order to change negative perceptions and to encourage young women across the country to get involved in engineering and technology, SWE has announced a new program: "Develop, Design, Discover ... Women Innovating with Technology."

And the timing couldn't be better. SWE's survey reveals that while 95 percent of girls said that careers in science fields are "cool," 66 percent of the same group claimed these careers are "not for them," citing that careers in entertainment(49 percent), fashion(46 percent), and cosmetics(48 percent) would be more interesting. It also underlines a major disconnect between girls' perceptions of engineering and those careers that actually need engineers to deliver new products: fashion, cosmetics, entertainment. Girls simply don't know that the very industries that

they would be interested in pursuing as a future career require engineers and technologists in all facets of the business. The program kicks off with an inspiring and educational special event series called "Wow! That's Engineering?", a new website([www.developdesigndiscover.org](http://www.developdesigndiscover.org)), the survey on girl's attitudes toward engineering, and a nationwide contest to find out what young women will discover next. For more information about SWE, visit [www.swe.org](http://www.swe.org).

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## NEW TECHNOLOGY/SPACE CURRICULA TO BE REVEALED

New standards-based curricula for technological literacy that focuses on the theme of space exploration will be revealed at the International Technology Education(ITEA) annual conference in Baltimore, March 23-25, 2006. The curricula consists of elementary, middle, and high school units that are based upon the nationally renowned Standards for Technological Literacy and articulated across grade levels. The units are designed to be stand-alone while also coordinated with the Center to Advance the Teaching of Technology and Science(CATTS) model, standards-based, K-12 curriculum, which is known as Engineering by Design(EbD). The new curricula will be contemporary, hands-on, and provide a real-world perspective of today's era of space exploration.

The Engineering by Design program is a standards-based model for Grades K-12 that was conceived by the International Technology Education Association's(ITEA), Center to Advance the Teaching of Technology and Science(CATTS). The first meeting of the schools that will be working together to implement components of the program, will meet at the ITEA Annual Conference. The EbD Network consists of schools in the CATTS Consortium States that have agreed to participate by implementing either the Foundations of Technology or the Invention and Innovation course. The Network will be working online to learn about the components of the courses and to share exemplars(examples of student work) in order to develop consistency. The EbD Network implementers will serve as models for other states to implement standards-based models. More information may be found at [www.engineeringbydesign.org](http://www.engineeringbydesign.org). For additional information about Triangle Coalition member, ITEA, visit [www.iteaconnect.org](http://www.iteaconnect.org).

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