

PARTNERSHIP FOR REFORM IN SCIENCE AND MATHEMATICS



IMPACT REPORT– OCTOBER 2008

PRISM's Ten Strategies

1. Offering customized professional learning in science and mathematics for K-12 teachers
2. Offering P-5 Science and Mathematics Endorsements for teachers
3. Providing opportunities to participate in P-16 Learning Communities, focused on improving teaching and learning in science and mathematics
4. Providing the Institute on the Teaching and Learning of Science and Mathematics
5. Improving teacher preparation programs in science and mathematics
6. Recruiting teachers to teach science and mathematics
7. Improving K-12 teacher working conditions
8. Implementing Georgia's Performance Standards in science and mathematics
9. Providing needed information to parents about the importance of taking challenging science and mathematics courses
10. Changing the higher education faculty reward structure

Vision

Increase science and mathematics (SM) achievement for all K-12 students in order to improve their readiness for post-secondary education and careers by enhancing teacher quality, raising expectations for all stakeholders, and closing the achievement gaps through the collaboration of K-16 partners.

PRISM is a comprehensive research, development and implementation project designed to test key strategies to increase student learning and achievement in science and mathematics in schools and colleges, to codify what works, to use it to influence statewide change in policy and practice, and to inform the nation about successes that should be replicated to rebuild America's competitive advantage in science and mathematics. In January 2003, the P-16 Department, within the University System of Georgia (USG), submitted a proposal for a Comprehensive Mathematics and Science Partnership (MSP) Grant to the National Science Foundation (NSF). This proposal was written by a partnership of seven University System colleges and universities and 15 public school systems in four geographical regions of the state with the University System and Georgia Department of Education. The award was announced in September 2003. The P-16 Department serves as the coordinating unit and fiscal agent for NSF's award of \$34.6 million over 5 years (2003-2008)

Approximately 170,000 K-12 students, 10,000 K-12 faculty and 575 University System faculty are or will be impacted through PRISM over the five years of the grant.

INSIDE THIS REPORT

- | | |
|--|---------|
| • 2007 Data Comparisons | Page 2 |
| • Governor Proclaims September 2008
Math + Science = Success Month in Georgia | Page 9 |
| • Highlights of the <i>Accepting the STEM Challenge</i>
Conference held in Atlanta on September 11-13, 2008 | Page 10 |

A LOOK AT K-12 STUDENT ACHIEVEMENT DATA BETWEEN PRISM DISTRICTS, DISTRICTS WITH SIMILAR DEMOGRAPHICS AND THE STATE FOR 2007

For comparison purposes 15 Georgia school districts were chosen based on the following similarities: total enrollment; percent free and reduced lunch; percent black; and percent white.

Chart 1: Change in Percent Meeting or Exceeding Standards for Elementary Mathematics

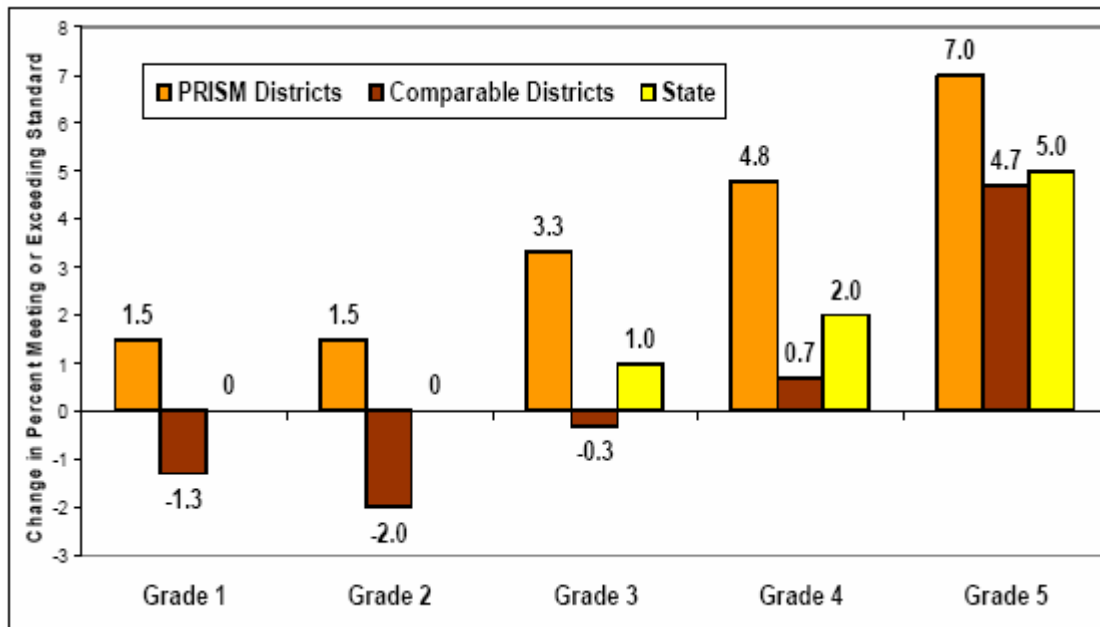


Chart 2: Change in Percent Meeting or Exceeding Standards for Middle School Mathematics

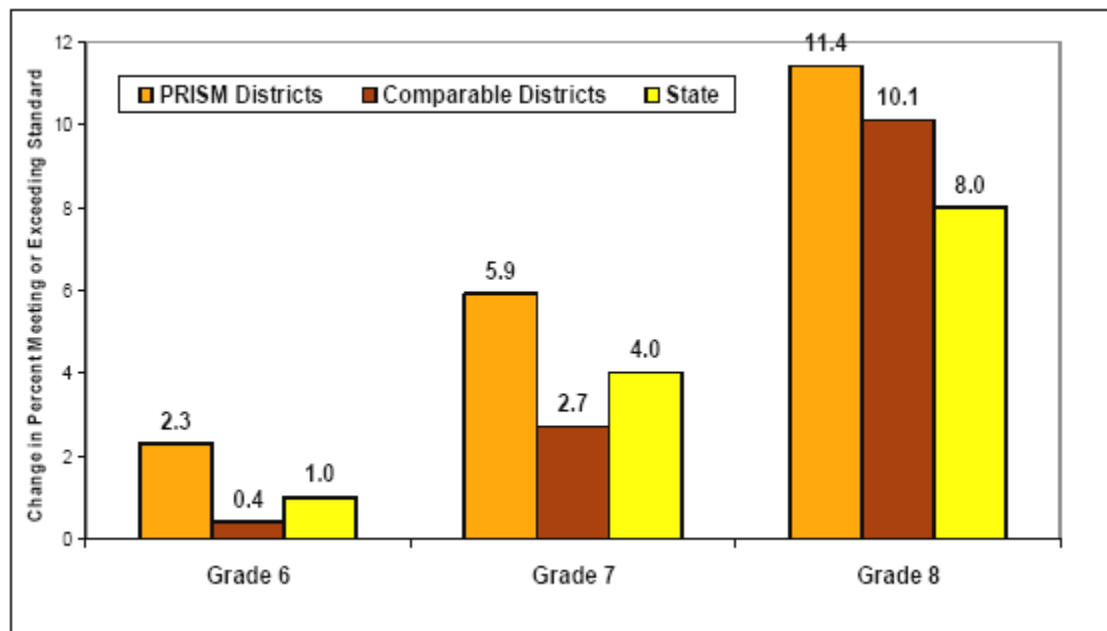


Chart 3 : Change in Percent Meeting or Exceeding Standards in Elementary Science

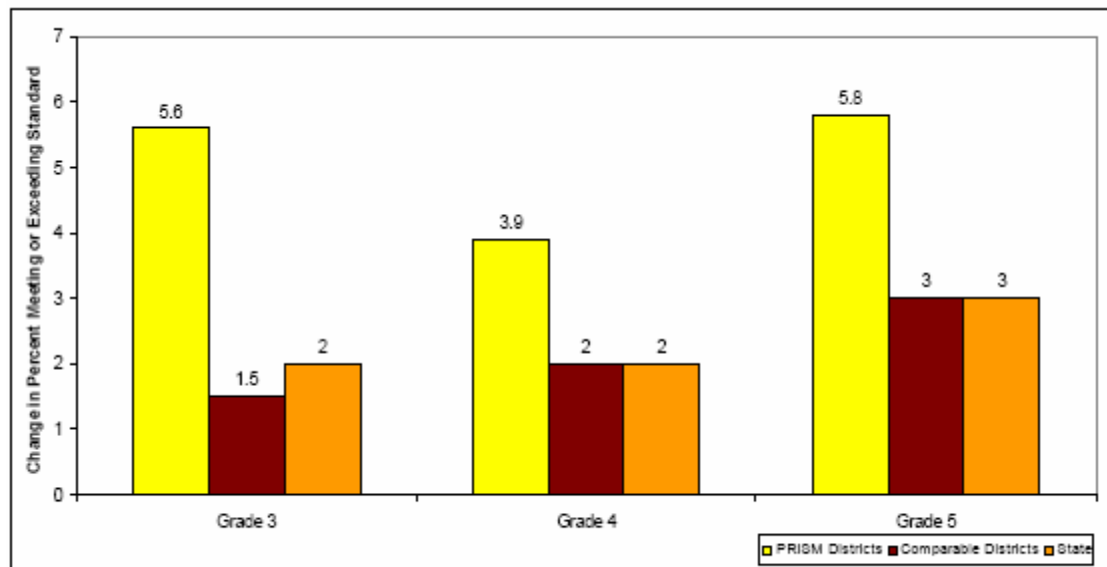
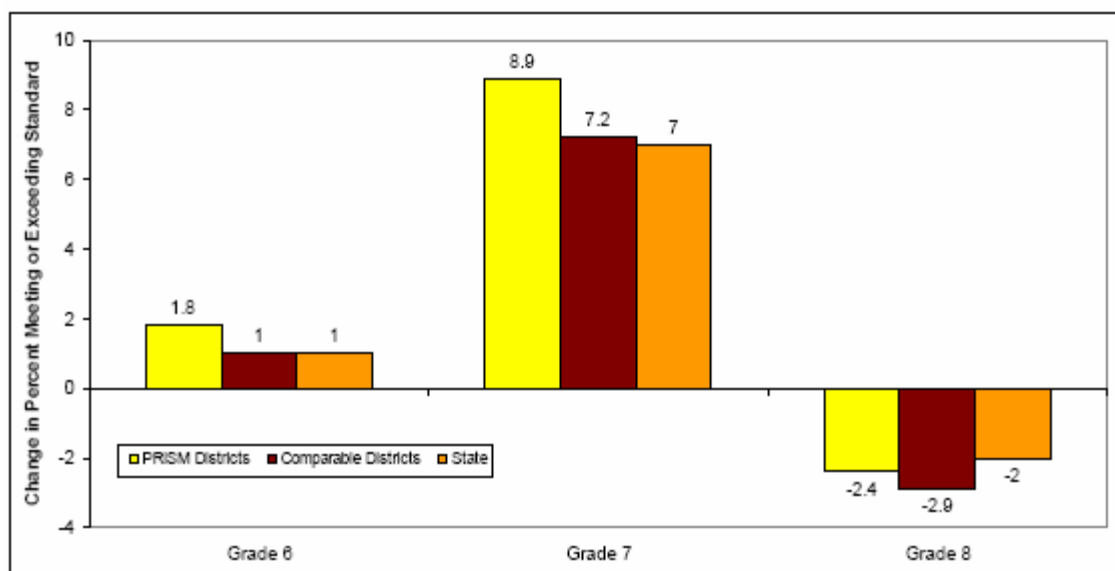


Chart 4 : Change in Percent Meeting or Exceeding Standards in Middle School Science



COMPARING THE BLACK-WHITE ACHIEVEMENT GAP BETWEEN PRISM DISTRICTS AND DISTRICTS WITH SIMILAR DEMOGRAPHICS FOR 2007

Chart 5: Elementary Mathematics

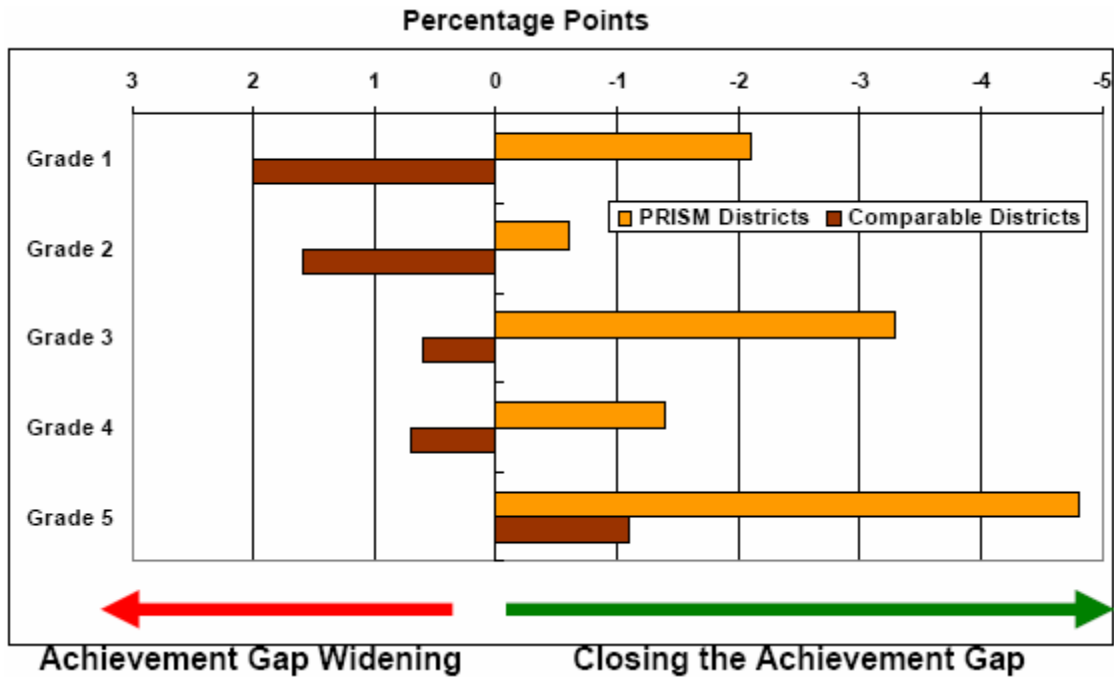


Chart 6: Middle School Mathematics

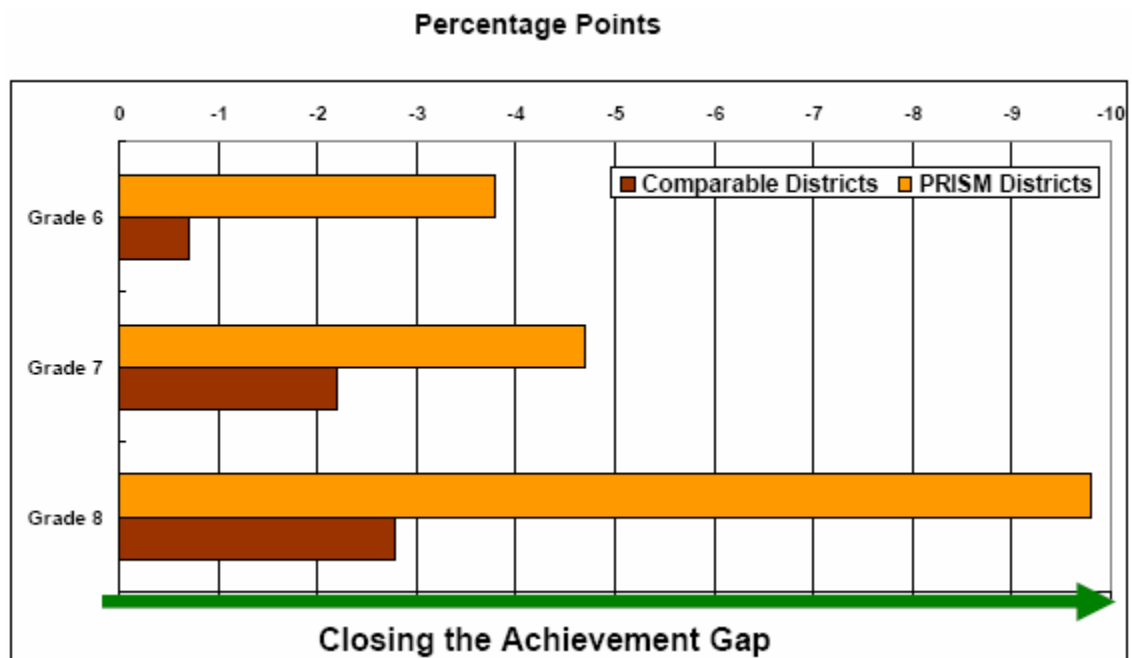


Chart 7: Elementary Science

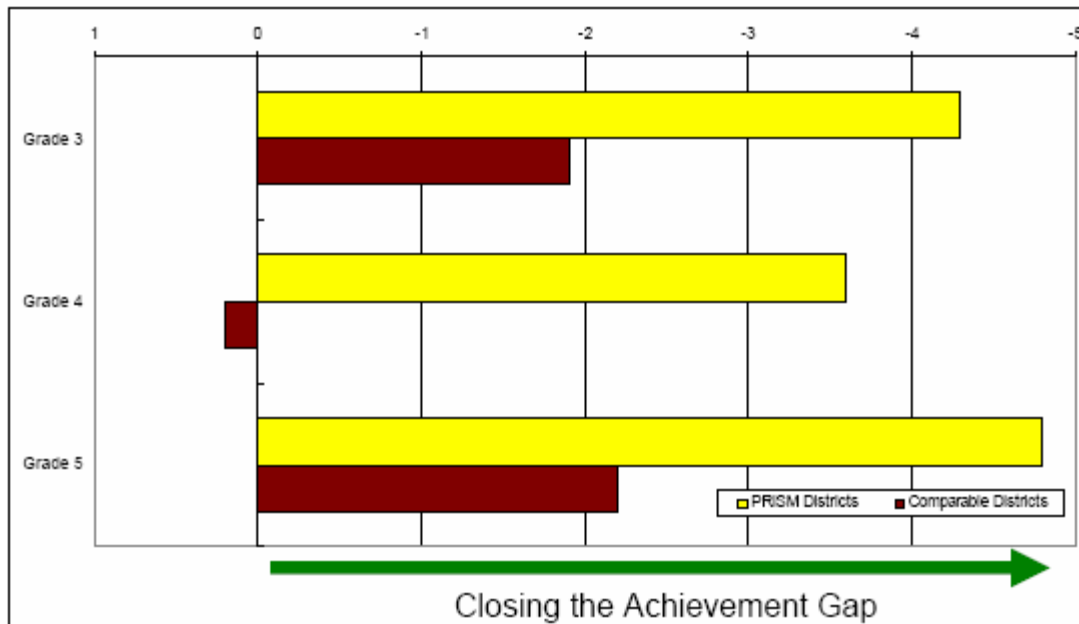
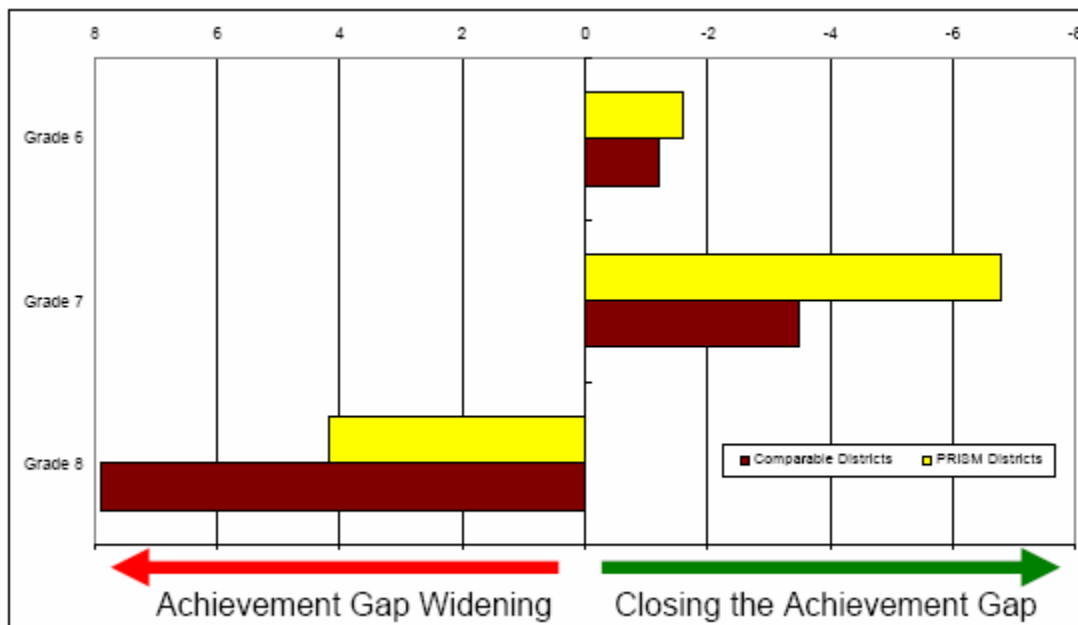


Chart 8: Middle School Science



CHANGES IN NUMBER OF HIGH SCHOOL STUDENTS TAKING ADVANCED COURSES IN SCIENCE AND MATHEMATICS IN PRISM DISTRICTS

**Chart 9: Percent of High School Students in PRISM Districts Taking Challenging
Science and Mathematics Courses: 2003-2007**

Year	Subject	Students in Basic	Students in Intermediate	Students in Advanced
2003	Life Sciences	6.7%	76%	21.1%
2007	Life Sciences	2.7%	77.7%	22.5%
2003	Physical Sciences	2.1%	59.7%	40%
2007	Physical Sciences	0.3%	55.2%	47.4%
2003	Mathematics	28.8%	66.3%	14.1%
2007	Mathematics	21.5%	72.6%	15.5%

Definition of Basic, Intermediate, and Advanced Courses

Basic courses in science and mathematics:

Principles of Technology I and II, Applied Biology/Chemistry I and II, Basic Mathematics I, II, III, and IV, General Mathematics I, II, III, and IV, Mathematics I and II, Applied Problem Solving, Applied Algebra, Applied, Geometry, Pre-Algebra, Fundamentals of Algebra, Concepts of Probability and Statistics, Concepts of Problem Solving, Concepts of Algebra

Intermediate courses in science and mathematics:

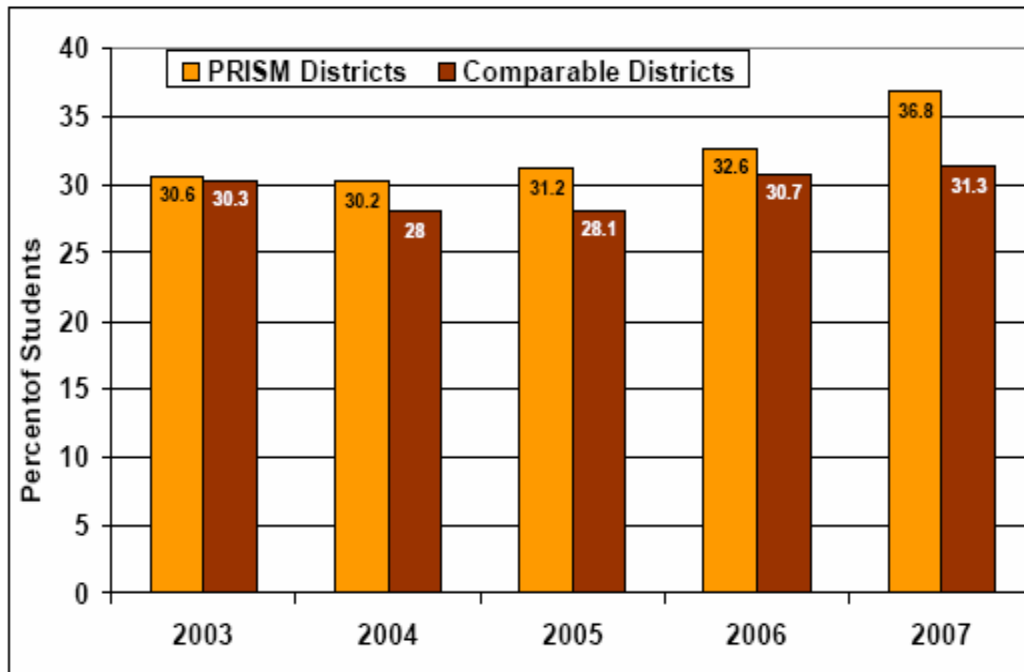
Biology I, Ecology, Environmental Science, Physical Science, Astronomy, Meteorology, Earth Science, Geology, Oceanography, Science Technology and Society, Mathematical Money Management, Algebra I, Informal Geometry, Euclidean Geometry, Algebra II, Algebra III

Advanced courses in science and mathematics:

Biology II, AP Biology, Genetics, IB Biology I and II, Botany, Microbiology, AP Environmental Science, IB Environmental Systems, Zoology, Entomology, Human Anatomy/Physiology, Chemistry I and II, AP Chemistry, IB Biochemistry, Physics I and II, AP Physics B and C, IB Physics I and II Honors, Astrophysics, Forensic Science, Advanced Physics Principles/Robotics, Advanced Scientific Research, Advanced Scientific Internship, Statistics, History of Mathematics, IB Mathematical Methods, IB Mathematical Studies, IB Mathematics I and II, Advanced Algebra and Trigonometry, Analysis (Pre-Calculus), Computer Mathematics, Discrete Mathematics, Calculus, AP Calculus AB and BC, AP Statistics, Advanced Calculus

When comparing the percent of students taking intermediate and advanced courses in science and mathematics to students in their comparison districts, PRISM continues to show more progress in improving the number and percent of students taking these courses. The example below show the percentage of students in Chemistry for the past five years.

Example—Chemistry 1



BRINGING MATH AND SCIENCE TO GEORGIA STUDENTS EVERYDAY



Our next generation of teachers—high school students in the Metro Atlanta region upon completion of the **Academy for Future Teachers** of science and mathematics.



Dad and son learning together at a Math Science Family Night.



Students participating in hands-on science!

A LOOK AT THE PASS RATES FOR MATHEMATICAL MODELING, COLLEGE ALGEBRA AND PRE-CALCULUS

Chart 10: Comparison of Percent of Students in PRISM Partner Universities and the University System of Georgia Passing the Course with an A, B, or C: 2003-2006

Year	Course Name	PRISM Institutions	University System	Difference
2003	Mathematical Modeling	61.4%	61.4%	0%
2006	Mathematical Modeling	67.8%	63.9%	3.9%
2003	College Algebra	56.1%	54.7%	1.4%
2006	College Algebra	58.7%	55.9%	2.8%
2003	Pre-Calculus	58.7%	56.8%	1.9%
2006	Pre-Calculus	61.9%	59.9%	2.0%

The University System of Georgia requires each institution to use the same course numbers for core mathematics courses. Data were collected on Mathematical Modeling, College Algebra and Pre-Calculus. The percent of students passing (A, B, C) these courses, has increased each year within PRISM partner colleges and universities. For the system as a whole, the increase has been smaller with a slight decrease seen in 2005 for College Algebra and Pre-calculus. The PRISM institutions have a slightly higher percentage of students passing with an A, B, or C than the system. Comparisons of core science courses between PRISM institutions and all USG institutions are more difficult since course numbers and titles are not the same at each institution.

PRISM WAS HONORED BY GOVERNOR PERDUE IN SEPTEMBER 2008 WHEN HE PROCLAIMED SEPTEMBER TO BE MATH + SCIENCE = SUCCESS MONTH. THIS COINCIDED WITH PRISM'S "ACCEPTING THE STEM CHALLENGE" CONFERENCE.



GEORGIA PRISM PRESENTS BEST PRACTICES TO EDUCATORS, BUSINESS LEADERS

Accepting the STEM Challenge Conference brought together educators, business leaders and policy makers to create an open dialogue about math, technology, engineering and science-based education

ATLANTA, September 24, 2008 – Vicky Butler, an educator in Oconee County, GA, is dedicated to ensuring that her students have all the tools and opportunities to take advantage of what The National Science Board describes as “the most innovative, technologically-capable economy in the world.” In the United States there has been a growing decline in students’ interest in science and math-based subjects. To combat this, Butler and other educators throughout Georgia and the nation attended the **Accepting the STEM Challenge Conference**, held last week in Atlanta.

The first-ever **Accepting the STEM Challenge Conference** was the focal point of Georgia PRISM’s (Partnership for Reform in Science and Mathematics) efforts to enact the **MATH+ SCIENCE = SUCCESS University System of Georgia Presidents’ Science, Technology, Engineering, and Mathematics (STEM) Initiative**. The initiative aims:

- to increase the number of K-12 students interested in mathematics/science/engineering,
- to increase the number of students in college who pursue the STEM disciplines,
- and to increase the number of teachers who are better able to keep K-12 students in the STEM pipeline.

The 325 attendees of the **Accepting the STEM Challenge Conference**, hailing from 18 states, were provided with opportunities to share best practices while gaining insights on how others are addressing the challenges associated with STEM education. They heard from the first woman to walk in space, a former Wyoming governor, Georgia State Superintendent Kathy Cox, a leader within New Tech Schools, and from many of their colleagues who offered best practices’ workshops.

The conference featured a panel discussion on the topic: *Reversing the Downward Spiral of Science and Mathematics Education in the United States*. The panelists, including former Wyoming Governor Jim Geringer, addressed the question of “how can actions taken across the domains of power and policy be aligned in a better way to reverse this downward spiral and drive up the number of highly qualified science and mathematics teachers?”

Day one of the conference focused on best practices for business and organizations. The first day’s keynote speaker, Susan Traiman, director of Public Policy at the Business Roundtable, spoke about a variety of topics, including best practices from the Roundtable’s “Tapping America’s Potential” campaign, which seeks to double the number of science, technology, engineering and mathematics graduates with bachelor’s degrees by 2015.

Day two, which targeted educational track attendees, provided a special treat as Kathryn Sullivan, PhD, director of The Battelle Center for Math and Science Education Policy at the John Glenn School of Public Affairs at Ohio State University gave the Keynote Address. The first of only seven American women to walk in space, Dr. Sullivan was selected as a NASA astronaut in 1978. Dr. Sullivan addressed the need for collaboration among business and education sectors, citing that the United States was being bested by countries who teach problem solving and critical thinking; both skills that can be attained through STEM education.

“I’m proud to be ending my career on such a high note,” said Jan Kettlewell, outgoing University System of Georgia Vice Chancellor for P-16 Initiatives and PRISM Principal Investigator. “**The Accepting the STEM Conference** brought together all the important elements, business, education, and government leaders, to have an open dialogue about STEM education in Georgia. It’s this dialogue that will bring about change.”



SCENES FROM THE ACCEPTING THE “STEM” CHALLENGE CONFERENCE



Breakout session — sharing lessons learned from participating in an AP Calculus Learning Community



*Keynote address from Kathryn Sullivan,
Director of the Battelle Center for Math
and Science Education Policy*



*Distinguished panel of business
leaders (left to right):*

Chris C. Collier, Southern Company

Kevan Torgerson, McKesson

Edward Swallow, Northrop Grumman

Ann Wilson Cramer, IBM North America



Participants from a PRISM Region



*Showcasing the PRISM Public Awareness Campaign
at the conference*



We're on the Web
www.gaprism.org
www.mathsciencesuccess.org



Coming Soon in the Next PRISM Impact Report

2008 K-12 student achievement data for PRISM districts
Release of PRISM Book *Increasing the Competitive Edge in Math and Science*

PRISM partners:

- 15 school districts with 275 schools: Atlanta Public Schools, Bryan, Bulloch, Camden, Candler, Chatham, Clarke, Effingham, Evans, Glynn, Jackson, Oconee, Screven, Toombs, and Vidalia City
- 7 colleges and universities: Armstrong Atlantic State University, Coastal Georgia Community College, Georgia Perimeter College, Georgia Southern University, Georgia State University, Georgia Institute of Technology's Center for Education Integrating Science Mathematics and Computing (CEISM), and the University of Georgia
- 4 regions in Georgia: Northeast, East Central, Southeast and Metro Atlanta
- 2 state partners: University System of Georgia and Georgia Department of Education



Supported by the National Science Foundation under Cooperative Agreement Number: EHR-0314953. Any opinions, findings, and conclusions or recommendations expressed in this document are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.