2. K-12: An Inadequate Reservoir Of Future Scientists

As the new millennium began, many K-12 measures of mathematics and science achievement were indicating substantial progress. For example, graduating high school seniors in 2000 posted the highest average SAT mathematics score (514 points) in 30 years {14}. In addition, the percentage of 17-year-old students scoring at or above 300 on the science portion of the National Assessment of Educational Progress (NAEP) increased steadily between 1982 and 1996 {15}. (A score of 300 or better on NAEP assessments indicates high performance in a subject area.)

However, the overall picture of K-12 education in math and science is not nearly as optimistic as these recent results seem to indicate. Findings from the Third International Mathematics and Science Study (TIMSS) revealed that U.S. 8th and 12th graders, as a whole, still perform at about the international average in both mathematics and science {16} {17}.

Further testament to the shortcomings of American science and mathematics education is offered by the 2000 United States Department of Labor solicitation for grant applications under the "H-1B Technical Skill Training Grant Program." Through this program, funds will be available for programs to prepare U.S. workers to hold high-tech jobs presently being filled by foreign workers under the provisions of H-1B. This effort provides evidence that the United States can no longer maintain the unmatched technical prowess achieved in the 20th century by its own citizens. The economic security of the country is at risk due to the failure of the public educational system to confer sufficient science and mathematics skills. Although standardized test scores in mathematics and science have risen in some segments of the population, the reservoir of American K-12 students who have the background to pursue baccalaureate degrees in the sciences or technology is small, even when compared to their counterparts in the poorest developing nations.

Efforts to increase the flow of skilled U.S. workers must begin with the reform of K-12 education, which has failed to adequately prepare students—especially women, underrepresented minorities, and persons with disabilities—in science, mathematics, or technology. High-quality education is a particularly relevant issue with regard to minority children, who today constitute a majority of the nation's 50 largest school systems, and whose educational opportunities are the most dismal. Currently, minorities make up 33% of the nation's school age population; by 2035 this percentage will grow to half of all school-aged children (see Figure 2-1) {19}.

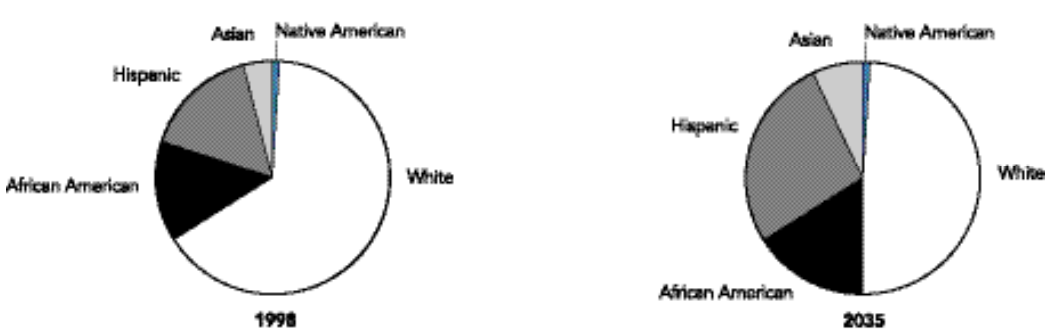
2.1 Women and Men Differ on Attitudes Towards Mathematics

Overall, male students still outperform female students on key benchmark measures such as the NAEP or TIMSS. Female high school students are now taking and completing upper level high school mathematics and science courses at the same rate as males. However, females still tend to hold more negative attitudes about mathematics than do their male peers.

NAEP Results

For 9-year-olds, male and female performance results on NAEP mathematics and science assessments is nearly identical, with mean scale scores varying no more than 1 or 2 points in favor of males throughout the 1990s (see Table 2-1) {15}. For 13- and 17-year-olds, gender differences remain small for both mathematics and

Figure 2-1: Distribution of, and Projections for, 5-to-19-year-olds in the U.S. by Racial/Ethnic Group: 1998 and 2035



Source: U.S. Department of Commerce, 1996; 1998; 1999; 2035 projections: data within *Land of Plenty*, Commission for the Advancement of Women and Minorities in Science, Engineering and Technology, July, 2000 {19}.

science. However, males still outscore females, and performance differences among 17-year-olds in science failed to narrow during the 1990s. In 1990, and again in 1999, 17-year-old males outscored 17-year-old females in science by around 10 points.

Table 2-1: Main NAEP Trends in Mathematics and Science Assessments

	Mathematics			Science		
Age 9	**1990**	**1994**	**1999**	**1990**	**1994**	**1999**
Male	214	221	233	230	232	231
Female	213	219	231	227	230	228
White	220	228	239	238	240	240
African American	189	193	211	196	201	199
Hispanic	198	202	213	206	201	206
Age 13						
Male	263	268	277	259	259	259
Female	262	269	275	252	254	253
White	270	278	283	264	267	266
African American	238	238	251	226	224	227
Hispanic	244	247	259	232	232	227
Age 17						
Male	297	301	310	296	300	300
Female	291	298	307	285	292	291
White	301	306	315	301	306	306
African American	268	276	283	253	257	254
Hispanic	276	284	293	262	261	276

Source: U.S. Department of Education, National Center for Education Statistics (NCES), *NAEP 1999 Trends in Academic Progress: Three Decades of Student Performance*, 2000. Washington, D.C. {15}.

TIMSS Results

With regard to TIMSS, male U.S. 8th graders outperformed female U.S. 8th graders in both mathematics and science, but like the NAEP outcomes, differences are small. Females score, on average, 497 in mathematics and 528 in science, in comparison to males, who average 502 and 540 respectively. Neither gender difference in mean scores is statistically significant. Nonetheless, with regard to mathematics performance male U.S. 8th graders are about "average" from an international perspective. Their TIMSS performance is lower than 19 nations and better than the average level of achievement of their peers in 8 nations. In comparison, female U.S. 8th graders' TIMSS performance is lower than 22 nations and better than the average level of achievement of their peers in 7 nations. A somewhat similar picture exists with regard to science performance {17}.

Course Enrollments

Data from the 1998 NAEP High School Transcript Study reveal that females completed advanced level high school mathematics and science courses at the same rate as males {21}. The percentage of females and males completing the two most rigorous levels of mathematics coursework—pre-calculus through calculus—stood at 27% (see Table 2-2). The percentage of females and males completing both Chemistry 1 and Physics 1 stands at 18% and 20%, respectively. The percentage of females and males completing Chemistry II or Physics II stands at 7% and 8%, respectively.

Table 2-2: Course Taking Trends: Percentage of Male, Female, White, African American, and Hispanic American High School Graduates Completing Highest Levels of Mathematics and Science Courses

Course	Male	Female	White	African American	Hispanic American
Precalculus	15%	15%	17%	9%	11%
Calculus	12%	12%	13%	7%	7%
Chemistry I Or Physics I	30%	38%	34%	36%	29%
Chemistry I And Physics I	20%	18%	20%	13%	13%
Chemistry II Or Physics II	8%	7%	7%	5%	6%

Source: U.S. Department of Education, National Center for Education Statistics (NCES), *NAEP High School Transcript Study*, 1998. Washington, D.C. {21}.

Attitudes and Career Intentions

Increases in test performance and college enrollments have neither affected how female students feel about mathematics nor altered their interests in science, mathematics, engineering, and technology (SMET) careers. According to NAEP survey data, at the 12th grade level the percentage of females saying "I like mathematics" and "I am good at mathematics" declined from 1990 to 1996. In 1990, 53% of females and 63% of males agreed that they were good at mathematics; however, in 1996, both percentages declined. In 1996, less than half (47%) of the females agreed that they were good at mathematics, and only 48% agreed that they liked mathematics {15} {16}.

The lack of interest in mathematics among girls seems to influence their career intentions as high school

seniors. Among SAT-takers in 2000, females were less likely to express an interest in SMET careers than were males (see Table 2-3) {14}. A mere 18% of the 2000 SAT-takers who expressed an interest in an engineering major were female. A similar percentage of females (22%) expressed an interest in majoring in computer or information science. However, the majority (65%) of those who expressed an interest in a biological sciences major were female.

Girls' rejection of mathematics and science interests may be driven by teachers, parents, and peers, when they subtly steer girls away from the kind of informal technical pastimes (working on cars, fixing bicycles, changing hardware on the computer) and science activities (science fairs, science clubs) that too often are still thought of as the province of boys. Data show that girls are less likely than boys to be involved in science and mathematics activities outside of school, from using meters and playing with electromagnets to fixing machines and reading about technology {2}. Additionally, media and real-life images of women in scientific and technical careers are still rare (as are female role models and mentors in general), sending an unspoken message to girls that an SMET career is not for them.

Table 2-3: Percentage of College Bound Males and Females Expressing an Interest in an SMET College Major

Intended College Major	Male	Female
Biological Sciences	35%	65%
Computer or Information Science	78%	22%
Engineering	82%	18%
Mathematics	57%	43%
Physical Sciences	59%	41%
Technical and Vocational	68%	32%

Source: The College Board, "*SAT Math Scores for 2000 Hit 30-Year High*," The College Board News, October 30, 2000, (see http://www.collegeboard.org/press).

2.2 Underrepresented Minorities Still Fall Behind

Since the early 1970s, the test-score gap between white students and underrepresented minorities on the NAEP has narrowed. Still, white students continue to outperform both African American and Hispanic American students on the NAEP, as well as other key benchmark measures such as TIMSS and college entrance examinations. Underrepresented high school graduates are now taking and completing more upper level high school mathematics and science courses, but

K-12 Teaching Partnerships with Graduate Students

NSF's Graduate Teaching Fellows in K-12 Education (GK-12) program provides fellowships to enable graduate students and advanced undergraduates in SMET fields to assist teachers in elementary and secondary schools.

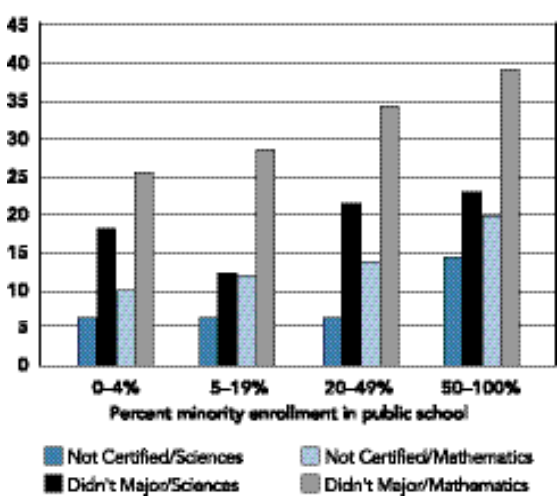
GK-12 Fellows instruct teachers and students, familiarize students with the skills necessary in SMET disciplines, and serve as role models for students. Examples of GK-12 projects include:

- **University of Arizona**. Fellows and their faculty mentors are gaining experience in inquiry-based teaching. Recruitment and selection processes are ensuring the participation of diverse groups, especially Hispanic minorities, which comprise about half the student population in Tucson.
- **University of Kansas**. Fellows work alongside teachers to develop course content and apply technology where possible. Each Fellow attends a one-week pre-assignment training workshop and a university-level course covering best practices in K-12 teaching, multicultural education, and cognitive skill development.
- **Johns Hopkins School of Medicine**. Ph.D. candidates are matched with teachers in local schools and receive formal training in classroom teaching. As student teachers in science and biotechnology, they serve as resources for urban high school teachers and share knowledge about classroom uses of technology.

the percentage doing so still lags noticeably behind rates for white students. This disparity in upper level math and science course enrollment results in underrepresented high school graduates going off to college less prepared than white peers (see *Who Is Prepared for College* sidebar at right). This latter condition relates directly to the fact that minority students progress through high school with more risk factors than do white students. For example, African American high school students are twice as likely to carry multiple risk factors such as being from a single parent household, having an older sibling who dropped out of high school, or repeating a grade {22}.

In addition, many African American and Hispanic American students attend schools in the inner city (32% and 25%, respectively). Significantly, students in these groups also tend to be enrolled in predominantly minority schools, which means that the majority of African American and Hispanic American students are isolated in schools that typically suffer from a grievous lack of resources. Although less data are available to document the access that Native American students have to educational resources, these students also attend impoverished schools.

Figure 2-2: Percentage of Public Secondary Students Taught Mathematics or Science by Teachers Without Certification/Major in Content Area



Source: U. S. Department of Education, National Center for Education Statistics. The Condition of Education 1998, NCES 98-013. Cited in 1998 Biennial Report to the United States Congress, NSF Committee on Equal Opportunities in Science and Engineering, 1998 Biennial Report to the United States Congress.

Who Is Prepared for College

The data below show the percentage of 1992 high school graduates qualified for admission to a 4-year post-secondary institution. The College Qualification Index is based on high school grade point average, senior class rank, the National Educational Longitudinal Study's aptitude test, SAT or ACT scores, and high school curricular rigor.

Race/ Ethnicity	Percent Marginally Qualified or Unqualified	Percent Highly Qualified	Percent Very Highly Qualified
Total	35.5	18.2	13.8
White	31.9	20.3	15.2
African American	53.1	9.9	6.3
Hispanic	47.0	10.8	7.9

Source: U.S. Department of Education, National Center for Education Statistics (NCES), *The Condition of Education 2000.* Washington, D.C. {24}.

The educational context in which learning occurs is another important determinant of student achievement. Data on variations in the educational resources to which different groups of students have access show that there are great disparities between the contexts in which minority and non-minority students learn. For example, minority students are more heavily concentrated in schools where it is more likely that they will be taught mathematics and science by less qualified teachers. A key indicator of teacher quality—especially for mathematics and science teachers—is whether or not the teacher has majored or has certification in mathematics or science. Figure 2-2 {23} shows that students in high minority enrollment schools are much more likely to be taught mathematics and science by a teacher who has neither a major nor certification in the content area being taught.

Overall, data on the distribution of resources in schools—including expenditures, qualified teachers, high quality curriculum, and computer equipment—show that inner city, high poverty, and high minority

Table 2-4: Race/Ethnicity and TIMSS Mathematics, Science Achievement: 1999 Mean Scores

	White	Nations Scoring Better	African American	Nations Scoring Better	Hispanic	Nations Scoring Better
Mathematics	525	12	444	30	457	28
Science	547	5	438	31	462	26

International Mean Math: 561 International Mean Science: 513

Source: U.S. Depertment of Education, National Center for Education Statistics, *Pursuing Excellence: Comparisons of International Eigth-Grade Mathematics and Science Achievement from a U.S. Perspective, 2000.* Washington, D.C. {17}.

enrollment schools consistently receive fewer resources than do schools that serve high percentages of white students. High minority enrollment secondary schools also offer less extensive and less demanding science and mathematics programs, giving minority students fewer opportunities to take the courses necessary to help them pursue science and mathematics majors in college. Further, underrepresented minority students are disproportionately placed in lower-track courses, and thus have less access to higher level courses even when they are in schools that offer these courses.

The lack of educational resources experienced by underrepresented minority students affects both their achievement and participation in mathematics and science; and achievement and participation data indicate that it scarcely matters whether underrepresented students of color have an interest in SMET careers. Because of the inadequate education received, low achievement levels often preclude their successfully attempting a career in an SMET field.

NAEP Results

Regardless of grade, white students outperformed both African American and Hispanic American students on the 1999 NAEP mathematics and science assessments (see Table 2-1 on page 6). Gaps were narrowest at age 9 and 13, widest at age 17. Gaps also were wider in science than in mathematics. Typically, white students outperform African American and Hispanic American students in mathematics by 15-30 scale score points. Whites outperform African Americans and Hispanic Americans in science by 25-50 scale score points.

TIMSS Results

With regard to TIMSS, white U.S. 8th graders outperform African American and Hispanic American 8th graders in both mathematics and science, and the differences in performance are extremely large and statistically significant (see Table 2-4) {17}. White 8th graders score, on average, 525 in mathematics and 547 in science. In comparison, African American 8th graders score, on average, 444 in mathematics and 438 in science, while Hispanic American 8th graders score 457 in mathematics and 462 in science. For whites, TIMSS mathematics performance is about "average" from an international perspective—with 12 nations scoring better. Their science performance is topped by five nations in the world. However, African Americans and Hispanic Americans score significantly lower than the international averages in both mathematics and science {17}.

College Entrance Examinations

The college entrance exam scores for historically underrepresented minority students still lag far behind the scores of white students, and those differences did not change much between 1988 and 1998 (see Table 2-5) {25}. In 1988, on the SAT math component, African American and white mean scores were nearly 100 points apart (418 and 514 points, respectively). Ten years later, the gap stood at 102 points (426 and 528 points). Score gaps for various Hispanic American students were less severe. Mexican American and white mean math scores were over 50 points apart (460 and 528 points, respectively). Similar score differences also exist on the ACT. Data from the 2000 ACT, however, reveal several promising trends. For example, African American students who took the ACT and graduated with mostly college preparatory courses recorded their highest subscale score in science reasoning {26}. Score differences between white and underrepresented minority students, however, have not had a negative impact on the aspirations of underrepresented minority students planning to seek advanced degrees. According to data from the College Board, nearly 60% of both African American and Hispanic American students aspire to advanced degrees (M.A. or Ph.D.), while 52% of white SAT-takers expressed similar aspirations {25}.

Table 2-5: 10-Year Change in Average SAT Math Scores

	1988	1998	Difference
White	514	528	14
African American	418	426	8
Hispanic	463	466	3
Mexican American	460	460	0
Puerto Rican	434	447	13
Total	501	512	11

Source: The College Board, "*College-Bound Students Set Records in Racial and Ethnic Diversity, Precollege Credit, and Grades*," The College Board News, 1998, (see http://www.collegeboard.org/press) {25}.

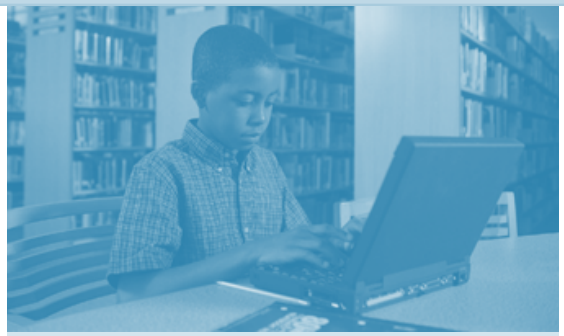
Course Enrollments

The enrollments of African American and Hispanic American high school students in the highest levels of mathematics and science courses increased significantly between 1982 and 1994 (see Table 2-6) {27}. In 1982, 26% of African American high school students enrolled in Algebra II. In 1994, their enrollments stood at 44%. Similar increases occurred for Hispanic American students, who saw their enrollments climb from 23% in 1982 to 51% in 1994. Still, in 1994, white students had higher enrollments rates than either African American or Hispanic American students, and the percentage of white students completing the two most rigorous levels of mathematics coursework—precalculus through calculus—stood at 30%, compared to 16% for African American students and 18% for Hispanic American students. White students also outpaced African American and Hispanic American enrollments in chemistry and physics, with nearly two-thirds of them completing various levels of these two courses, compared to half the African American and Hispanic American high schoolers.

Table 2-6: Race/Ethnic Differences in Students Taking Algebra 2 and Chemistry, 1982 to 1994

	Percent taking Algebra II		Percent taking Chemistry	
	1982	1994	1982	1994
White	41%	62%	35%	59%
African American	26%	44%	23%	44%
Hispanic	23%	51%	17%	47%

Source: Rolf K. Blank and Doreen Langesen. *State Indicators of Science and Mathematics Education 1999*, Washington, DC: Council of Chief State School Officers, 1999 {27}.



Minority Participation in Advanced Placement (AP) Exams Rises

The data below illustrate that the number of African American and Hispanic American high school students taking Advanced Placement (AP) Examinations and qualifying for college credit and/or advanced courses at college increased substantially between 1988 and 1998. Still, African American high school students represent just 4% of all AP-exam takers and 5% of graduating seniors qualifying for college credit and/or advanced courses at college. Hispanic American students represent 9% of all AP-exam takers and 8% of graduating seniors qualifying for college credit and/or advanced courses at college. Each of these numbers reveals that while minority youngsters have made great strides in AP-exam participation they are still underrepresented when compared to their total representation in the U.S. high school population. Together, African American and Hispanic American high school youngsters make up more than 30% of the U.S. high school population.

	Number Taking AP Exams		
	1988	1998	Increase
White	215,110	403,553	88%
African American	10,448	27,054	159%
Hispanic	13,322	53,627	303%
Total	288,372	618,257	114%

	Number Graduating AP Seniors		
	1988	1998	Increase
White	113,632	216,406	62%
African American	6,691	15,085	125%
Hispanic	7,665	25,240	229%
Total	175,572	321,443	98%

Source: The College Board, *1998 College-Bound Seniors, National Report*. September 1, 1998 (see http://www.collegeboard.org/press/senior98/html/980901.html) {25}.

Limited Availability of Data about Persons with Disabilities

In contrast to women and minorities, the availability of data on persons with disabilities in science, mathematics, engineering, and technology is seriously limited. The paucity of data is due primarily to the following factors:

1. Different data sets and studies utilize varying definitions of "disability." Although the passage of the Americans with Disabilities Act (ADA) has clarified somewhat the definition of disability, the term is used to describe a wide range of physical and mental conditions.
2. For school-aged children, a good indicator of disability status is the existence and nature of the child's Individual Education Program (IEP) that is prepared as part of the special education process.
3. Information for adults found in the records of educational institutions and employers is typically self-reported. Such self-reported responses reflect individual decisions to indicate a disability. They are likely to be subjective and may well be dependent upon the context of the report. For example, a person with a disability may be concerned that reporting the disability to an employer may result in workplace discrimination.
4. Institutional records often do not include comprehensive information on disability status. Concerns about confidentiality necessitate self-reporting and limit dissemination.
5. Measures of disability status used in surveys and special studies vary considerably, at least in part because of varying goals of study designers and users. For example, the informational needs of those who study workplace equity are quite different from those who provide medical services to individuals with severe disabilities and the needs of both of these groups are different from those of educational specialists.

NSF collects data on the disability status of scientists and engineers, using a common definition of disability patterned after one developed by the Census Bureau. This measure is based on asking individuals, "What is the USUAL degree of difficulty you have with [specific tasks involving seeing, hearing, walking, and lifting]. Respondents are given five choices for each response, ranging from "none" to "unable to do." Having a disability is defined for these surveys as having at least moderate difficulty in performing one or more of these tasks. While this definition was designed to provide a relatively objective measure of disability, it is important to note that not all disabilities are captured by this measure. For example, learning disabilities and behavioral disorders are not included.

NSF does not collect data on individuals at the K-12 or undergraduate levels. The National Center for Educational Statistics does collect data for those educational levels, but in many instances does not include measures of disability status. One important survey in which this information is reported is the National Post-Secondary Student Aid Study (NPSAS), which asks students, "Do you have any disabilities such as hearing, speech, or mobility impairment, or vision problems that can't be corrected with glasses?" If the student answers in the affirmative, he or she is asked about the specific disability {31}.

Although it is difficult to compare information reported from different sources, some general conclusions on the participation of persons with disabilities in science and engineering can be drawn from the growing body of available data.

NSF Sponsored Programs Addressing SMET Challenges

Support for Teacher Preparation

The Collaboratives for Excellence in Teacher Preparation (CETP) program of NSF supports cooperative, multi-year projects to increase the quality and number of well-prepared science and mathematics teachers, especially among historically underrepresented groups. Collaboratives are comprised of SMET faculty, education faculty, and pre-school teachers.

Collaboratives design curricula that integrate mathematics, the sciences, and engineering; use advanced technologies; identify applications in engineering and technology; and utilize new methods of student assessment.

Among more than 110,000 undergraduate and post-baccalaureate students in CETP institutions who are preparing to become teachers, close to one-half are members of minority populations – in contrast to 13% minority representation in the current teaching workforce.

CETP projects include college recruitment of high school students with interest and ability in mathematics, university recruitment on two-year college campuses with large minority enrollments, and scholarship awards to outstanding prospective teachers.

Access and Motivation for Students, Teachers, and Scientists with Disabilities

Since 1991, NSF's Program for Persons with Disabilities (PPD) has supported projects to remove barriers to full participation in SMET coursework and careers by individuals with impaired hearing, vision, physical agility or dexterity, or learning disabilities. PPD grants fall into three categories:

- **Demonstration projects**. Innovative intervention strategies include workshops, camps, and mentoring programs that promote access to instructional materials and technologies and offer interpersonal support.
- **Research and development**. A typical project is the development of computer-based audio systems that use voice synthesizers to allow individuals with visual and learning disabilities to read technical publications.
- **Information dissemination**. These projects promote awareness of what individuals with disabilities can achieve with appropriate understanding and support.

According to reports from grant recipients, more than 70% of high school students who participate in PPD activities go on to higher education and the majority continue to study SMET.

It is worth noting here that while many minority students are now graduating from high school better prepared than 5 or 10 years ago, many challenges remain. Recent reports from both the College Board and ACT reveal that minority students still earn lower grades than do their white peers, which unfortunately is associated with lower performance on both the SAT and ACT. In 2000, African American ACT-takers reported that their lowest high school grades were in mathematics and science courses {26}. And Advanced Placement Examination data from the College Board show that while minority student participation is rising, and doing so dramatically, African American and Hispanic American students are still underrepresented among AP-exam takers. African American high school students represent just 4 percent of all AP-exam takers and Hispanic Americans 9 percent of all AP-exam takers (see sidebar, *Minority Participation in AP Exams Rises*).

2.3 Academic Achievement of Students with Disabilities

Between 1989 and 1998, the number of school-aged children (6–21) reporting with disabilities climbed 29%, while public elementary and secondary school enrollment grew by 17%. U.S. schools now serve more 5.4 million children with disabilities. More than half (52%) of these children had specific learning disabilities, and one-fifth (20%) had speech or language impairments. Academic achievement outcome data on students with disabilities is limited, but available data suggest that students with disabilities do not perform well in science and mathematics compared to their peers who do not have disabilities {28}. In addition, college-bound students with disabilities lag far behind their peers without disabilities on the SAT.

NAEP Results

Regardless of the NAEP assessment or grade in which students were tested, students with Individual Education Programs (IEP) performed lower than students without disabilities (see Table 2-7) {28}. Differences in mean scale scores, in both mathematics and science, tend to be smaller among 4th graders and larger among 8th and 12th graders. Typically, in the secondary grades students without disabilities outperform students with disabilities by 40 to 50 scale score points.

When NAEP mathematics and science results are further disaggregated by gender and race/ethnicity, data show that male students with IEPs consistently outperform female students with IEPs, and white students with IEPs outperform non-white students with IEPs. Overall, male and female mathematics and science score differences are small, ranging from 5–10 scale score points; however, score differences between white and non-white students are generally as large as 20-30 scale score points.

Table 2-7: Main NAEP Scores for Students with and without an Individual Education Program (IEP) in Schools Permitting Testing Accommodations

Mathematics	With IEP	Without IEP
Grade 4	206	225
Grade 8	234	275
Grade 12	257	303
Science		
Grade 4	130	152
Grade 8	115	152
Grade 12	111	151

Source: U.S. Department of Education, Office of Educational Research and Improvement. *21st Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act* 1999. Washington, D.C. {28}.

SAT Results

Approximately 7% of college-bound high school seniors taking the SAT in 2000 reported a disabling condition {14}. In 1994, SAT-takers with disabling conditions stood at 4% {29}. In 2000, the average SAT mathematics score for students with disabilities was 485 points, compared with 514 points for other students. And students taking the SAT under nonstandard testing conditions, or special accommodations, scored slightly lower at 474 points.

High School Completion Rates

In 1997, approximately 25% of the high school students with disabilities aged 17 and older graduated with a standard high school diploma {28}. Graduation rates differ greatly among the various disabilities conditions. More than a third of the students with speech and language impairments receive a diploma, compared to 8% of the students with autism. Graduation rates for students with disabilities can be misleading, however, because graduation requirements for many students with disabilities frequently are based on standards and requirements that are "watered" down. In fact, many states allow students with disabilities to graduate with fewer than 15 Carnegie "credit" units. Typically, students without disabilities exited high school in 1998 with 25 Carnegie "credit" units {30}. Moreover, while more than one-third of these graduates enroll in college, the number of high school graduates with disabilities doing the same stands at 16.5% {30}.

Assistance for Urban Schools

NSF's Urban Systemic Initiative (USI) program fosters partnerships between urban school districts and two- and four-year colleges and universities that conduct educational research. Projects are designed to:

- Increase student achievement and enrollment.
- Improve implementation of standards-based, inquiry-centered K-12 curricula.
- Improve the competency and diversity of science and mathematics teachers in school districts that serve the largest number of school-aged children living in poverty.

The program incorporates Comprehensive Partnerships for Mathematics and Science Achievement. USI initiatives have resulted in significant increases in minority enrollment in higher level science and mathematics courses. For example, in Memphis, the number of students graduating with three years of college preparatory mathematics and three years of science increased from 41% to 66%. In Los Angeles, USI high schools showed an increase in the percentage of students who were eligible to attend the University of California and California State University, while at other high schools, the percentage of eligible students declined.