

## Girls and Science, Math, and Engineering

### Girls and boys have similar math and science proficiency scores. (See Figure 1.)

- ◆ During the 1990s the number of high school students who took science courses increased. By the end of high school, more young women than young men had taken biology and chemistry; more young men than young women had taken physics.<sup>9</sup>
- ◆ In grades 4, 8, and 12, the average scores of White and Asian/Pacific Island students have consistently been higher than the average scores of Black, Hispanic, and American Indian students, though the gaps have narrowed.<sup>5</sup>

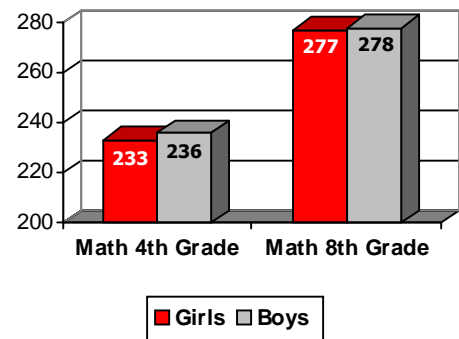
### Girls and young women are less likely than boys and young men to agree with the statements "I like mathematics" and "I like science."<sup>4</sup> In a national survey:

- ◆ 40% of girls and 31% of boys said that math is their least favorite subject;
- ◆ 21% of girls and 17% of boys said that science is their least favorite subject.

### Students who take advanced placement math and science courses in high school are more likely than those who do not to major in science and/or engineering in college.<sup>8</sup>

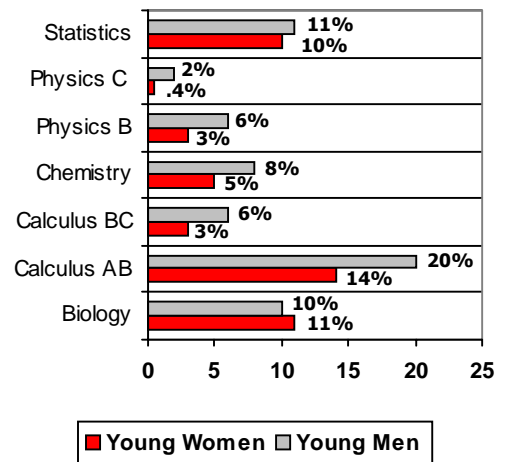
- ◆ Young women comprise 58% of advanced placement students in biology, 44% in chemistry, 47% in calculus AB, and 38% in calculus BC.<sup>8</sup>
- ◆ Advanced placement courses/exams allow high school students to earn credit or advanced standing at many universities and colleges. Young women account for 56% of all advanced placement exam candidates and 45% of advanced placement candidates in math and science.<sup>8</sup> (See Figure 2)

**Figure 1:** Average NAEP\* scores in math among fourth and eighth grade students in the U.S., 2003.<sup>5</sup>

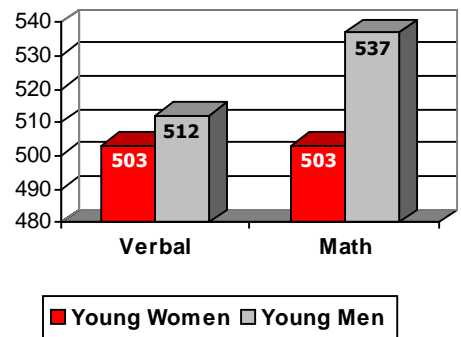


\* National Assessment for Educational Progress

**Figure 2.** Percentage of high school students taking math and science advanced placement exams by sex, 2002.<sup>9</sup>



**Figure 3.** Average SAT verbal and math scores by sex, 2003.<sup>9</sup>



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## Girls and Science, Math, and Engineering (2)

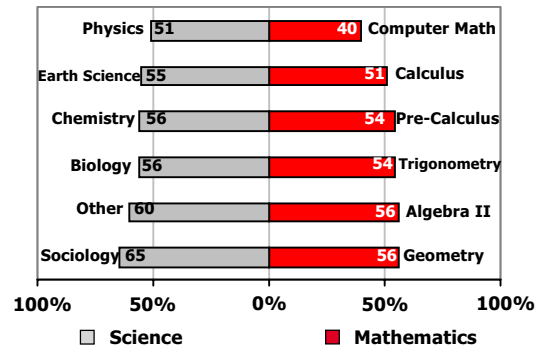
**Among high school seniors taking the Scholastic Aptitude Test (SAT) in 2003, 54% were young women.<sup>10</sup>**

- ◆ Grade point averages in math and the natural sciences were higher for young women than for young men. However, verbal and math scores on the SAT were higher for young men than for young women.<sup>9</sup> The average math score for young women was 503, a 19 point increase since 1993.<sup>8</sup> (See Figure 3)
- ◆ Among SAT takers a higher percentage of young women than young men are enrolled in honors math (55% and 45%) and honors science courses (57% and 43%). In 2003, 56% of young women and 44% of young men who took the SAT had at least 4 years of mathematics courses; and 55% of young women and 45% of young men had at least 4 years of science courses.<sup>9</sup> (See Figure 4)
- ◆ In 2003, three-fourths of the SAT takers wanting to major in computer science and engineering were young men. Sixteen percent of young women intended to major in computer science and 18% intended to major in engineering.<sup>9</sup> (See Figure 5)

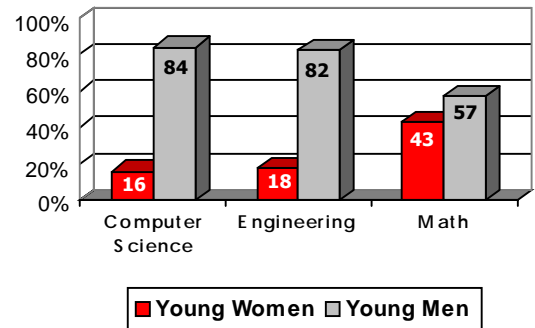
**Career intentions in science, math, and engineering differ among young women and young men.**

- ◆ Within each racial/ethnic group, women differ regarding their intentions to major in science and/or engineering fields.<sup>8</sup> (See Figure 6)
- ◆ Overall, women are less likely than men to intend to pursue a science or engineering degree; however, women are more likely than men to intend to major in social/behavioral or biological/agricultural sciences.<sup>8</sup>
- ◆ In a recent survey of teenagers, 7% of teenaged girls intend to work in science, engineering, and technology (compared to 17% of boys); 49% intend to work in “other” professions including law and medicine (compared to 25% of boys); and 9% intend to work in business (compared to 15% of boys). In this survey, girls rated themselves significantly higher than boys on organizing projects/activities, finishing projects on time, being creative, being good listeners, and writing reports; girls rated themselves significantly lower than boys on working with numbers, making decisions, and solving problems.<sup>4</sup>

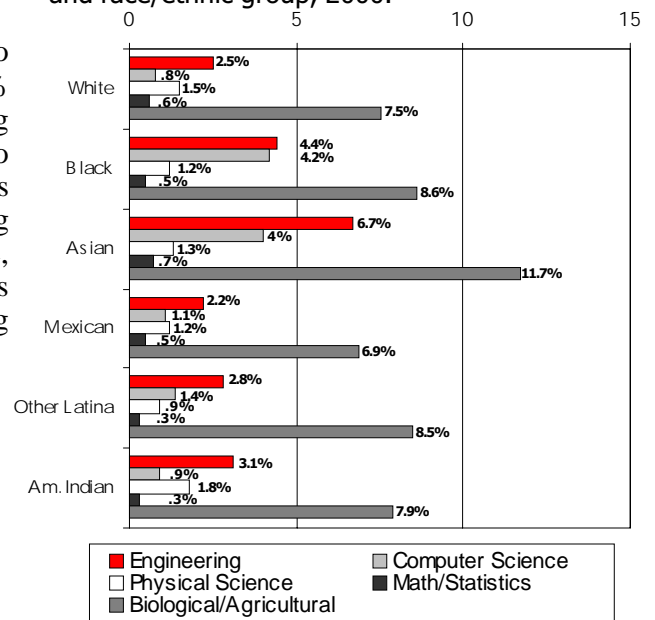
**Figure 4:** Percentage of female high school SAT takers who took selected math and science classes, 2003.<sup>9</sup>



**Figure 5:** Percentage of young women and young men who took the SAT and intend to major in computer science, engineering, and math, 2003.<sup>9</sup>



**Figure 6:** Percentage of young women intending to major in science and engineering by field and race/ethnic group, 2000.<sup>3</sup>



## Girls and Science, Math, and Engineering (3)

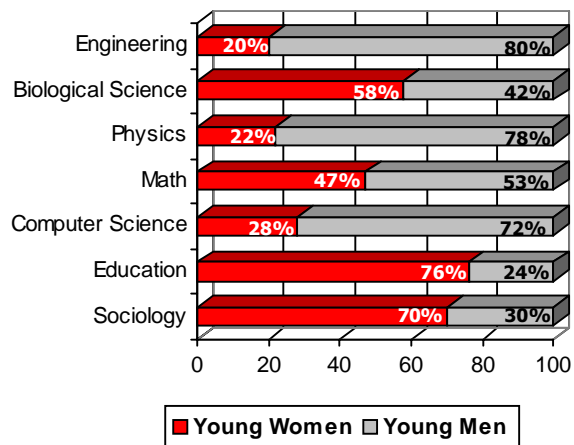
### Mathematics is still a gateway to higher education and employment.

- ◆ According to the National Center for Education Statistics, lower income students are more likely than higher income students to have low math scores on national tests such as the National Assessment for Educational Progress (NAEP). The average math scores for students who are eligible for free/reduced price lunch are lower than the average scores for those who are not eligible. Among 4th grade students there is a 22 point difference in math scores for those who are eligible to receive a free lunch (222) and those who are not (244). Among 8th grade students there is a 28 point difference in math scores for those who are eligible to receive a free lunch (259) and those who are not (287).<sup>5</sup>
- ◆ In a recent study conducted among young workers in the US, most blue-collar workers (60%) have taken geometry and most professional/white collar workers (84%) have taken at least Algebra II.<sup>2</sup>

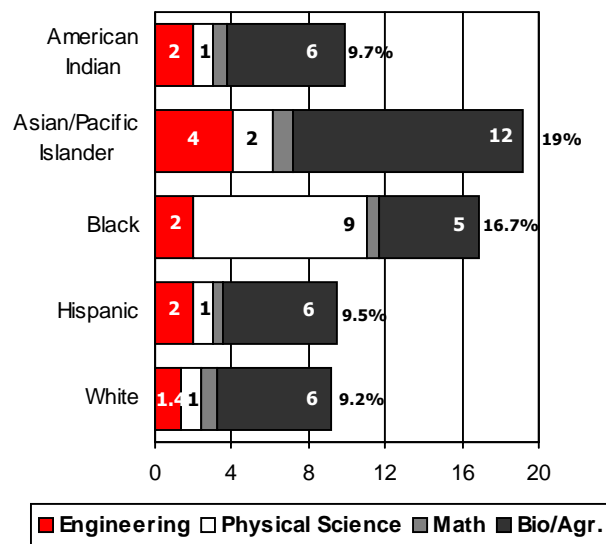
### More than half (57%) of the nation's undergraduates are women.<sup>13</sup>

- ◆ Since the early 1970s, women have made dramatic gains in postsecondary education. More women than men now aspire to enroll in college and complete bachelor's degrees. Gender differences in college majors persist, however, with women still earning a higher proportion of degrees in education and sociology, and men in engineering, physics, and computer science. (See Figure 7)
- ◆ In 2000-2001, women earned 58% of bachelor's degrees in the biological/life sciences (biology, biochemistry/ biophysics, botany, cell and molecular biology, microbiology/bacteriology, and zoology), 20% in engineering, 22% in physics, and 47% in mathematics. Of all bachelor's degrees earned by women in 2000-2001, 2% were for engineering, 10% for the natural sciences, 1% for mathematics, and 6% for the biological and agricultural sciences.<sup>15</sup> (See Figure 8)
- ◆ Among college freshmen women surveyed in 2000, 28% of American Indian women, 33% of Asian women, 33% of Black women, 27% of Mexican and/or Puerto Rican women, 29% of other Latina women, and 24% of White women were majoring in math or science fields. In each of these groups, fewer than 2% were in the physical sciences and fewer than 4% were in the computer sciences. Except among Asian women, the highest proportions (11-15%) were in the social and behavioral sciences, followed by the biological and agricultural sciences.<sup>3</sup>

**Figure 7.** Percentage of conferred bachelor's degrees by subject and by sex, 2000.<sup>13</sup>



**Figure 8.** Of all bachelor's degrees awarded to women in 2000, percent earned in science, math, and engineering by discipline and by race/ethnicity.<sup>6</sup>



Note: For each group, 1% or fewer earned bachelor's degrees in math.

## Girls and Science, Math, and Engineering (4)

**Women are enrolled in graduate programs at a rate equal to that of men but are underrepresented in the physical sciences, engineering, computer science, and mathematics.**

- ◆ In 1971 women earned 18% of all master's degrees in science and engineering fields.<sup>1</sup> In 2000, women earned 31% of all master's degrees in science and engineering fields<sup>13</sup> and of these 9% were in engineering, 3% in mathematics, and 9% in computer science.<sup>6</sup>
- ◆ In 2001, women earned 55% of the master's degrees in the biological and life sciences.<sup>13</sup>

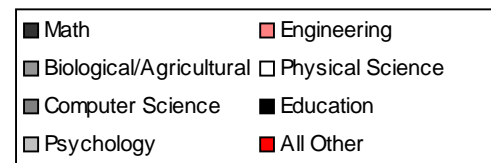
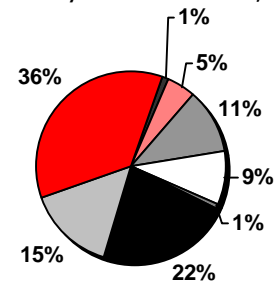
**Women are more likely than men to end their graduate education at the master's level.<sup>6</sup>**

- ◆ In 2000, just under 20,000 women earned doctoral degrees compared to just over 25,000 men. Of doctoral degrees earned by women 5% were in engineering, 1% in math, 1% in computer science, 11% in the biological/life sciences, 22% in education, and 15% in psychology.<sup>13</sup> (See Figure 9)

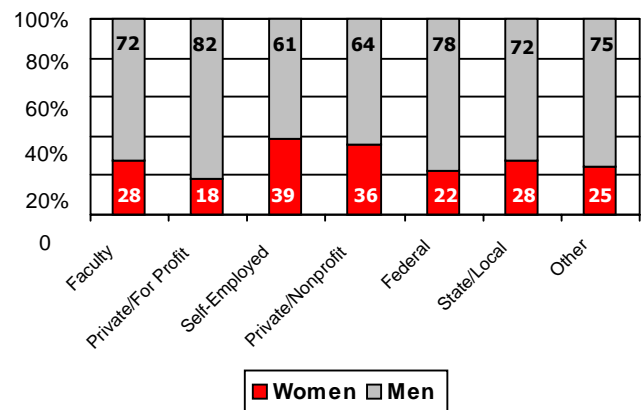
**"Women constitute 45% of the workforce in the US but hold only 12% of science and engineering jobs in business and industry."<sup>11</sup>**

- ◆ Overall in 2001, women comprised 29% of computer and mathematical scientists, 45% of biological and life scientists, 24% of physical and related scientists, 55% of social and behavioral scientists, and 10% of engineers.<sup>14</sup>
- ◆ Women are approximately 26% of employed scientists and engineers with doctoral degrees compared with 20% in 1993.<sup>7</sup> The percentage of women science faculty is increasing though few are in leadership positions. Fewer than 10% of full professors in the sciences are women even though women have been earning more than one-fourth of the PhDs in the sciences for the last 30 years.<sup>11</sup> (See Figure 10)
- ◆ In 2001, women who were employed in science and engineering professions earned an average of 68 cents to 89 cents for every dollar earned by a man, depending on the field.<sup>14</sup> In 1970 the average was 76 cents for all fields.<sup>12</sup>
- ◆ Women working as full-time engineers, computer scientists, physicians, pharmacists, and lawyers have the highest median weekly earnings, averaging \$1,040 per week. (See Figure 11) Although these occupations are the highest paying for women, they comprise just 10% of full-time engineers, 29% of mathematical/computer scientists, 33% of physicians, 42% of pharmacists, and 34% of lawyers.<sup>14</sup>

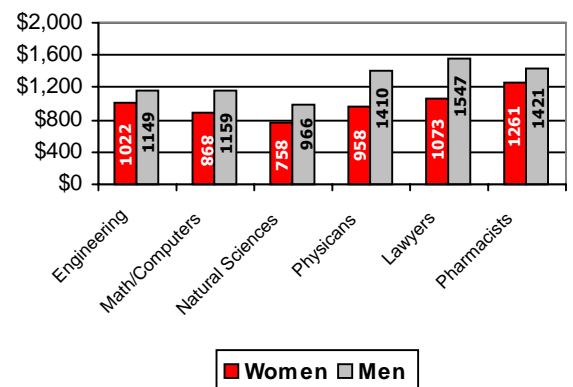
**Figure 9.** Percentage of women who earned doctoral degrees by selected fields, 2000.<sup>13</sup>



**Figure 10.** Employed doctoral scientists and engineers by sector of employment, and percentage by sex, 2001.<sup>11</sup>



**Figure 11.** Full-time, median salaries for women and men in selected fields, 2001.<sup>14</sup>



## Girls and Science, Math, and Engineering (5)

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**For more information on girls and science, math, and engineering see these Girls Incorporated® Facts Sheets:**

- ◆ **Girls and Information Technology**
- ◆ **Girls and Careers**

**Girls Incorporated®** covers this issue in its program Girls Inc. Operation SMART<sup>SM</sup>, which helps girls build skills and interests in science, math, and relevant technology.

**Girls Inc.** is a national nonprofit youth organization dedicated to **inspiring all girls to be strong, smart and bold<sup>SM</sup>**. For over 50 years, Girls Incorporated has provided vital educational programs to millions of American girls, particularly those in high-risk, underserved areas. Today, innovative programs help girls confront subtle societal messages about their value and potential, and prepare them to lead successful, independent and fulfilling lives.

**Girls Inc.** reached 685,000 girls in 2002 through direct service, the website, and Girls Inc. products and publications. In 2002, Girls Inc. programs were offered through a network of 1,500 program sites. Over 1,000 of these were in schools. In addition, girls received our strong, smart, and bold message over 90 million times through our public service announcements. Guided by our vision of empowered girls and an equitable society, Girls Inc. is committed to reaching millions more girls through its program and public education efforts. Of the girls the organization serves, over 75% are girls of color; 77% come from families earning \$25,000 annually or less; and 54% live with one parent.

**Girls Inc.** develops research-based informal education programs that encourage girls to take risks and master physical, intellectual and emotional challenges. Major programs address science, math and technology, health and sexuality, economic and financial literacy, sports skills, leadership and advocacy, violence prevention, and media literacy for girls ages 6-18 throughout the United States and Canada.

**The Girls Incorporated National Resource Center (NRC)** is the organization's research, program development, national services, and training site. Research and evaluation conducted by the NRC provide the foundation for Girls Inc. programs. The NRC also responds to requests for information on girls' issues and distributes Girls Inc. publications.

**Girls Inc.** informs policy makers about girls' needs locally and nationally. The organization educates the media about critical issues facing girls. In addition, the organization teaches girls how to advocate for themselves and their communities, using their voices to promote positive change.

**Girls Inc.** is a nonprofit organization which receives 77 percent of its revenue from public support – corporations, foundations, government grants and individuals. The remainder comes from affiliate dues, fees, interest and dividends. More than three-quarters of the organization's functional expenses go directly to support program services for girls.

**Girls Inc.** national leadership focuses on developing innovative ways to leverage our most valuable asset – acknowledged expertise as the nation's premiere program provider and advocate for girls – to expand our reach to more than a million girls by the year 2002. Our leaders include Francis X. Burnes, III, Chair of the National Board; Joyce M. Roche, President and CEO; and Donna Brace Ogilvie, Honorary Chair.



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