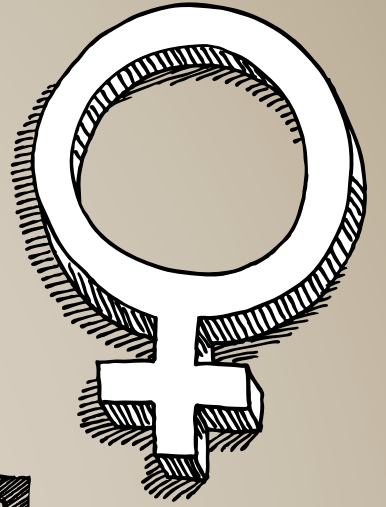


**WHY WOMEN**  
**CAN GAIN THE**  
**EDGE IN STEM**  
**CAREERS**



## UNTAPPED OPPORTUNITIES

Despite the increasing representation of women in science, technology, engineering and math (STEM) degrees, they're still under-represented in many STEM jobs.

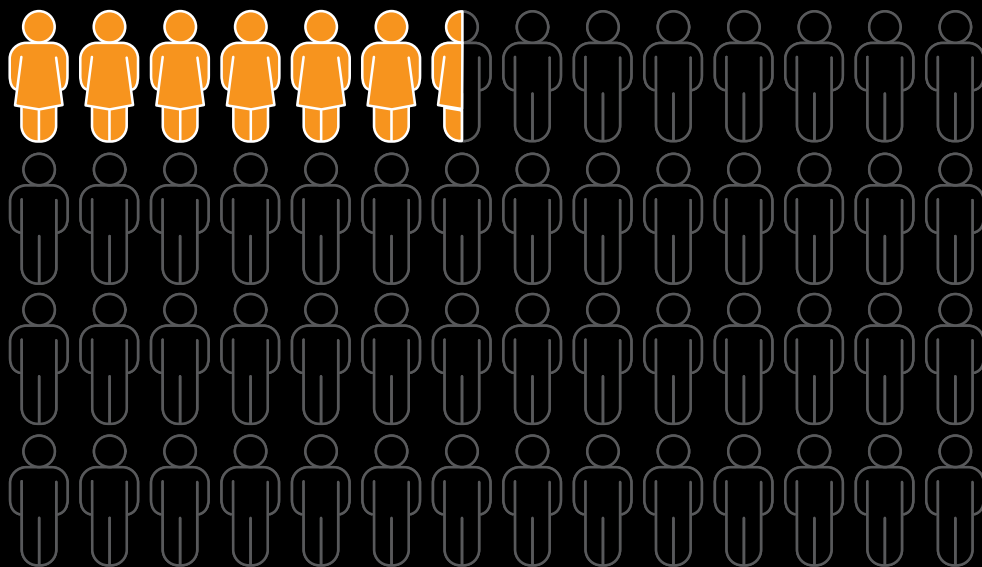
Many of these technical professions still seem to be dominated by men, even though many women are gaining the qualifications to do them, or are showing increasing interest and aptitude.

STEM jobs are one of the strongest growth engines in the global economy, and this is the reason why organizations must attract more women into these roles, and why larger numbers of women must seek to gain these skills.

In the race for companies to improve their share of diversity, and to appropriately represent women in leadership roles, women have an advantage in STEM careers. They have a perspective and way of working that companies want and need—they're an essential part of improving innovation, flexibility and agility in the current-day workplace.

"Innovations and creativity in STEM will be the drivers of tomorrow's economy. If you're not a participant on that frontier you will trail behind it and possibly get left behind entirely."

**Neil deGrass Tyson, Scientist**



IN 2010-11,

**11.7%**

OF COMPUTER SCIENCE  
BACHELOR DEGREES WERE  
GRANTED TO WOMEN

## WHY THE DEFICIT?

**It's the same across most of the developed world. Women make up around half of the paid workforce and at least half of the college-educated workforce, yet are still earning less—even for the same job—as men.**

**W**ithin this imbalance it's hardly surprising to hear that women are also vastly underrepresented in STEM jobs and among STEM degree holders, particularly in the fields of engineering and IT.

These statistics on the deficit of women in STEM careers from the U.S. hold lessons for most of the developed world:

- Although women fill close to half of all jobs in the U.S. economy, they hold less than 25 percent of STEM jobs. This has been the case throughout the past decade, even as college-educated women have increased their share of the overall workforce.
- Women with STEM jobs earned 33 percent more than comparable women in non-STEM jobs—considerably higher than the STEM premium for men. As a result, the gender wage gap is smaller in STEM jobs than in non-STEM jobs.

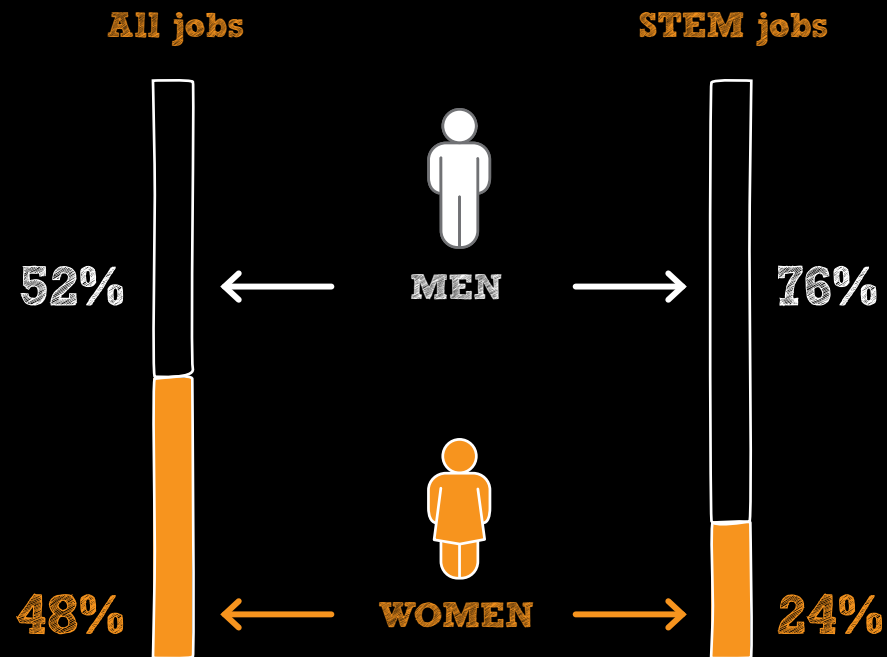
- Women hold a disproportionately low share of STEM undergraduate degrees, particularly in IT and engineering.
- Women with a STEM degree are less likely than their male counterparts to work in a STEM occupation; they are more likely to work in education or healthcare.

Addressing this imbalance is not just a matter of reducing discrimination and inequality, it's an economic imperative that the future of knowledge economies depends upon.

All developed nations are faced with the need to raise productivity, and increase competitiveness through innovation. Without actively engaging half of their workforce in achieving this, the chances of doing so are dramatically decreased.

The deficit may be there, but the economic imperative to change it is too.

## GENDER SHARES OF TOTAL AND STEM JOBS



## CHALLENGING THE STEREOTYPES IN STEM

We don't always like to admit it, but common stereotypes prevail in education and affect females' entry to STEM careers.

### AMONG THE MOST COMMON ARE STEREOTYPES SUCH AS:

- 'boys are better at math than girls'
- science and math fields are "men's jobs"
- women are better suited to the arts and humanities fields because they're more empathetic and creative
- women aren't interested in technology

Culturally prescribed roles influence our occupational interest and these stereotypes ultimately affect the performance and aspiration of women and minorities in STEM fields. Even when the evidence proves men and women are equally proficient in math—today, girls are doing as well as boys in math—the stereotypes persist.

Changing this requires women to look at the facts of their ability and challenge their own (and others') assumptions. It also requires educational facilities, teachers and employers to encourage and promote women who show aptitude and interest in these areas.

"We need to get girls interested in computing by first grade. By fifth grade, it's game over. Computing has an image crisis. A boy geek subculture has grown up around gaming that involves violence. It's not something little girls aspire to. It's not about lack of educational opportunities for women. Smart girls graduate from high school with straight A's, go to college, and find themselves surrounded by guys who've been hacking for 10 years. So they're way behind. They get discouraged, and go into law or medicine."

**Audrey MacLean,**  
interviewed by Adrianna Gardella  
for the NY Times, June 24, 2011



## FINDING GREAT ROLE MODELS AND REAL-WORLD EXAMPLES

Interest in an occupation is influenced by many factors, including a belief that one can succeed in that occupation.

Students who lack confidence in their math or science skills are less likely to engage in tasks that require those skills and will more quickly give up in the face of difficulty. If self-doubt takes hold, the desire to pursue courses like calculus and chemistry decreases. Research shows that:

- when a girl believes that she can learn what she needs to know in STEM subjects—as opposed to believing that a person is either born with science and math ability or not—she is more likely to succeed in a STEM field.
- Girls are more likely to assess their mathematical abilities lower than boys with similar mathematical achievements. At the same time, girls hold themselves to a higher standard than boys in subjects like math and science, believing they have to be exceptional to succeed in “male” fields. Long-term, this equates to fewer girls aspiring to STEM careers.
- Seeds need to be planted at an early age so women see the connection between education and real-world applications. A recent research effort reported an increase in middle school girls’ interest in engineering after the girls were exposed to a 20-minute narrative delivered by a computer-generated female agent describing the lives of female engineers. The narrative included positive statements about students’ abilities to meet the demands of engineering careers and counteracted stereotypes by emphasizing the people-oriented and socially beneficial aspects of engineering.
- Another outreach project that focused on educating high-achieving, mostly minority, high school girls about what scientists and engineers actually do has had significant success. Although the girls knew almost nothing about engineering at the start of the study, of the 66 percent of girls still participating after two years, 80 percent were seriously considering a career in engineering.

No matter when or where you wish to start your STEM career, finding great role models is key. Whether in the classroom or in the workplace, having a strong support system of fellow students, teachers, colleagues or mentors reduces feelings of isolation and improves retention in STEM educational and career pursuits.



## DEMONSTRATING THE SOCIAL VALUE OF STEM

**For girls, a lack of interest in STEM is based on a different value system they tend to put on their work.**

From early adolescence, girls express less interest in math or science careers than boys do. One explanation points to the well-documented gender differences that exist in the value that women and men place on doing work that contributes to society, with women more likely than men to prefer work with a clear social purpose.

How a math or technology skill will translate into improving people's lives, bettering social outcomes and improving community connections isn't always clear in educational literature. It seems that STEM careers often fail to appeal to women (or men) who value making a social contribution—but this is not because they don't contribute to society, it's because we don't always communicate that contribution well. Medicine is a clear outlier on this count—women now outnumber men in general medicine courses and are entering general practice at a higher rate than men.

In many ways, the social purpose of STEM careers will be better delivered by having more women involved in them in the first place, and we may well see rather different

technologies, engineering achievements and medicines as a result. Women make up half the population, and companies also want and need to know what they want as consumers. They want their input in product development, infrastructure and technology and it's only by attracting more into these high demand fields that this knowledge can be gained.

Employers who wish to attract more female candidates in STEM fields must look at how their opportunities are marketed and what is conveyed about the role throughout the hiring process. Allowing women to experience aspects of the company and the role could significantly increase interest in some positions.

For women seeking the right STEM role, asking more questions about the social and community aspects of your work is key. By communicating that this is important to you as a candidate, you'll find the right cultural fit in a prospective employer.





## REDUCING WORKPLACE BIAS

**Implicit biases still exist in the workplace that make it more difficult for women to advance in STEM fields, and which contribute to defection among women in STEM careers.**

Beyond stereotypes, a key issue for women's pursuit of and longevity in a STEM career are flexibility and work-life balance. Partly because they are already male-dominated, STEM careers can be seen as being less accommodating to flexible work arrangements and less suitable for people cycling in and out of the workforce to raise a family.

A recent retention study found that most women and men who left engineering said that interest in another career was a reason, but women were far more

likely than men to also cite time and family-related issues. Women in STEM are also more likely to have a partner who is also in a STEM field, and who therefore faces a similarly demanding work schedule. In a situation where a "dual-worker family" exists, the man's career is often given priority.

Again, it's up to women already in the field or entering it to help change these biases, and for employers to consider what they are willing to offer in the workplace in order to attract the much-needed skills that women bring.

## WHY STEM CAREERS ARE GREAT FOR WOMEN

Knowledge economies—those that make up most of the developed world—rely on the growth of one scarce and remarkable commodity in their workforce: knowledge.

But they don't thrive on just any kind of knowledge; it has to be the kind that drives innovation and competitiveness. It has to be the kind that's hard to achieve, otherwise it doesn't provide a competitive edge.

STEM knowledge and qualifications continue to top the list of most sought-after and difficult-to-find skills from employers. And, STEM degrees show exceptional 'pay back' to employees for the effort and cost that's required to achieve them. Analysis of salaries and employment figures shows that STEM qualifications provide:

- 1. Higher salaries:** All STEM degree holders receive an earnings premium relative to other college graduates, whether or not they end up in a STEM job. Likewise, college graduates (regardless of their major) enjoy an earnings premium for having a STEM job. No matter what their occupation, STEM majors make substantially more over their lifetime than non-STEM majors, by about \$300,000.
- 2. Lower unemployment:** STEM workers experience lower unemployment and enjoy earning premiums.
- 3. Flexibility and wage premiums:** All STEM degree holders receive an earnings premium relative to other college/university graduates, whether or not they end up in a STEM job.

### GROWING STEM OCCUPATIONS AND THEIR AVERAGE ANNUAL SALARY (2011):

- **Biomedical Engineers:** \$88,360.
- **Environmental Engineers:** \$83,340
- **Civil Engineers:** \$82,710
- **Medical Scientists, Except Epidemiologists:** \$87,640
- **Biochemists/Biophysicists:** \$87,640
- **Software Developers, Systems Software:** \$100,420
- **Database Administrators:** \$77,350
- **Network and Computer Systems Administrators:** \$74,270

Math and science skills are what scientist Neil deGrass Tyson calls the 'engines of problem solving' in the world. These are the skills that employers want and women must seek to gain their share to participate in the growing industries of the future.

# HOW TO GET A STEM JOB

## **1. Investigate minority academic scholarships**

Many universities offer scholarships to encourage a more diverse graduate STEM pool. If you're a woman from a minority group, be sure to inquire about all of the scholarship opportunities available. Many times you can get information about these scholarships by joining and participating in professional organizations that cater to females in STEM careers.

## **2. Get involved in a professional association**

There are professional associations targeting women and minorities to help support the development and growth of women and minorities in STEM careers. A great example is The Society of Women Engineers. These groups are great to join for networking, mentorship and professional development. If you are in college, look into joining a professional society or STEM-focused group on campus.

## **3. Ask for training**

More than likely, if you work for an existing organization in a STEM field, they either currently or will soon be facing shortages of STEM skills. If you don't have them but you've already proven yourself in another capacity in the organization, and you think you have the passion and aptitude for a STEM skill, ask your organization to invest in retraining you for a role where they face these shortages.



## CONCLUSION

Businesses and employment opportunities are evolving in response to global economic changes—and women must respond to these if they are to redress the gender imbalances in the workforce and improve their economic standing.

Women with STEM skills have a unique selling proposition to employers: not only do they have the skills to do these jobs, they can increase workforce diversity and improve inclusion outcomes in businesses (as well as consumer and community insights).

### **ACHIEVING A GREATER PROPORTION OF WOMEN ENTERING STEM COURSES AND JOBS WILL DO TWO THINGS. IT WILL:**

1. fill a critical gap in the employment market and improve skills shortages; and
2. change the outcomes we see for the community across the fields of science, technology and engineering.

It's time for women's voices to be heard in STEM fields, and finally, employers are sitting up and listening.



Did you know that Kelly Services hires 9,100 new STEM (science, technology, engineering, math) contractors every year? Last year alone, 28,700 science, engineering and technology contractors worked for Kelly. Accelerate your STEM career with Kelly at **[www.kellyservices.com](http://www.kellyservices.com)**

#### REFERENCES

- <http://societyofwomenengineers.swe.org/index.php/membership/benefits-a-discounts>
- <http://boss.blogs.nytimes.com/2011/06/24/why-women-have-an-advantage-in-technology/>
- [http://www.nap.edu/openbook.php?record\\_id=2264&page=17](http://www.nap.edu/openbook.php?record_id=2264&page=17)
- [http://www.diversitycareers.com/articles/college/11-sumfall/fod\\_women.htm](http://www.diversitycareers.com/articles/college/11-sumfall/fod_women.htm)
- <http://giving.tamu.edu/student/archives/rivera.aspx>
- <http://www.engineeringchallenges.org/>
- <http://www.cnn.com/2011/US/05/17/education.stem.graduation/index.html>
- Why so few? Women in science, engineering, technology, and mathematics; American Association of University Women (AAUW), 02/2010,
- Good Jobs Now and for the Future, U.S. Department of Commerce, July 2011
- STEM: Good Jobs Now and for the Future, U.S. Department of Commerce, July 2011
- Education Supports Racial and Ethnic Equality in STEM, US Commerce Department, September 2011
- Women in STEM: A Gender Gap to Innovation, U.S. Department of Commerce, August 2011
- STEM, Georgetown University, Center on Education and the Workforce
- <http://www.bls.gov>
- <http://www.commerce.gov/blog/2011/08/03/women-stem-opportunity-and-imperative>
- <http://www.dailymail.co.uk/health/article-2067887/Women-doctors-soon-outnumber-men-numbers-medical-school-fold.html>



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