



# Inspiring Confidence in Girls in Science, Technology, Engineering, and Math (STEM)

*Women in Technology's Three-Point Process for Engaging Female Students in STEM*



Photo from WIT's Girls Get IT "Behind the Scenes" event at McKesson in Alpharetta, GA (2010)





and parents, WIT has developed a three-point process for helping young girls develop confidence and passion when it comes to STEM-related topics and careers.

## Introduction

***The world of science and technology continues to advance at lightning speed: data transfer is faster than ever, cancer therapy medicines are successfully targeting certain cells, and NASA is sending unmanned aircraft to study atmospheric rivers and their impact on Earth's weather.***

Behind every advance in scientific, technological, engineering and mathematical fields someone is leading the charge. ***But too often, that someone isn't a woman.***

In fact, while women make up nearly half of the U.S. workforce, they compile only 26 percent of the science and engineering workforce.<sup>2</sup>

America lags behind other nations in the number of students majoring in science and engineering at colleges and universities, according to the National Science Foundation. Additionally, women make up just 9 percent of those receiving engineering degrees.

Why are more women not pursuing STEM degrees, and how can educators, parents and the community motivate girls and change this trend? Research proves girls are more likely to choose courses and careers in math and science if their interest in these fields is sparked and cultivated throughout the school years.<sup>3</sup>

According to Heather S. Rocker, executive director for Women in Technology in Atlanta, building girls' confidence in math and science is crucial to the future of STEM, and exposing girls early and often to the impact STEM has on our daily lives is a step anyone can take to inspire an early passion for STEM-related subjects.

"Studies prove during the middle-school years girls break away from STEM. Sometimes it's because they begin to doubt their ability in science and math. Other times it's because they buy into gender

*"Girls have to be asked to participate in STEM-related activities. When teachers, parents or mentors give girls a vote of confidence by asking them to participate, girls see themselves as belonging in that group. We need to get the village involved in building girls confidence in math, science and technology!"*

*—Suzy Crowe, Robotics Team Coach,  
Milton High School, Milton, GA.*

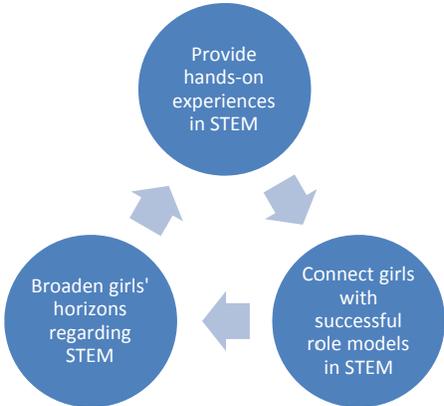
<sup>2</sup> National Science Foundation (2006c).

<sup>3</sup> Wigfield, Eccles, Schiefele, et al. (2006).



stereotypes (like boys are better than girls in math.) If we capture their interest early, we have a stronger chance of opening the world of possibilities of STEM for young girls.”

The promising news is there are easy steps which can be taken to inspire more girls to become future technology leaders by choosing careers in STEM-related fields: first, **providing hands-on activities to engage them in science and math**; second, **exposing them to successful role models in STEM fields**; and last, to **broaden their horizons as they consider how STEM impacts their world**.



### The Three-Point Process for engaging girls in STEM

#### Provide hands-on activities to engage girls in science and math

When it comes to engaging girls in STEM-related subjects, it is vital to spark their interest and build initial curiosity. The more exciting a task and the more involved they feel, the more secure the girls become in their ability to complete the task.

“Girls like to ‘do’ things, which is why it is important to give them a mix of experiences by providing many different hands-on activities,” says Suzy Crowe, the Robotics Team Coach and AP Computer Science and Math teacher at Milton High School in Milton, Ga.

“Boys and girls have a fear of failure, but girls in particular are judgmental about making mistakes. Participating in activities like robotics competitions or career exploration programs with hands-on activities lets the girls see mistakes are part of learning,” says Crowe.

WIT’s Girls Get IT recently hosted a Behind the Scenes program for middle-school girls at the Georgia Tech Nanotechnology Research Center, and the girls were given two hands-on projects to get them inspired.



“First, the girls did a size sorting activity where they line up a set of cards containing different objects from smallest to largest, which helps students understand they are more familiar with objects you can see and touch than those you can’t. Then, the girls did a comparison of sunscreens, testing whether the sunscreen with nanoparticles is as effective as sunscreen without nanoparticles,” said Joyce Palmer of the Georgia Tech Nanotechnology Research Center’s Education and Outreach Program.

Palmer says the girls were engaged with the activities and very enthusiastic as they asked questions of the undergraduate research students. “Many of the girls said how much fun they had and how much they learned. We consider our day spent with the girls a success.”

So how can parents, educators and members of the STEM community spark girls’ interest in STEM-related subjects?

1. Connect to current trends and news stories – space shuttle launches, new technology introduced in the marketplace, and new scientific discoveries are all great conversation starters. Ask girls what they think about the current trend, what kinds of efforts are used to launch different technologies, and how it impacts daily life.
2. Take advantage of local attractions and programming through astronomy clubs, aquariums, zoos, and summer camps and programs. Make it a family day, or allow her to bring a friend and make it a fun girls-day-out.
3. Encourage participation in programs provided by non-profits, like Women in Technology’s Girls Get IT programs. These programs are a perfect way to expose young girls to how much fun a career in STEM can be.
4. Point out items used in daily life – from sunscreen and makeup to cars and computers – and discuss how science, technology, engineering, and math impact each of these things.

### **Partner her with a STEM role model**

Have you ever thought about how the SPF 50 sunscreen you slather on at the beach protects you from a sunburn, or how your paycheck is automatically deposited into the correct checking account, or how your latte comes out the exact right temperature every single time?

There’s probably a woman in technology behind these products and processes, and whether she’s just starting out or at the pinnacle of her career – she has valuable information that can inspire young girls to take the leap into a career in STEM.

According to the Institute of Education Sciences in the U.S. Department of Education, exposing girls to female role models who have succeeded in math and science is an effective means of encouraging girls to choose careers in math and science-related fields.



Additionally, connecting them with STEM role models:

- Improves girls’ beliefs about their abilities
- Improves their performance on math tests
- Invalidates negative gender stereotypes (like boys are better than girls at math)

Because exposing girls to role models in STEM fields has such an impact on their future, several years ago WIT launched the Girls Get IT Job Shadow Program. The number of girls participating in the Job Shadow program has quadrupled over the past 5 years with demand from students outweighing available spots. The 2011 program included female role models from companies such as AutoTrader.com, McKesson, SunTrust, and Turner Broadcasting System.

“So many cool women in technology are involved with WIT - and young girls didn’t know they existed or how incredibly fascinating their work is,” says Heather Rocker, WIT executive director. “We also discovered introducing girls to successful women in STEM fields – giving them examples of real women having really interesting careers — encouraged them to get excited about STEM and stay engaged through high school and often into college.”

Learning about role models through speakers and mentors “teaches students that struggle and eventual success are normal. This knowledge seems to reduce anxiety and boost motivation when the student encounters challenges in work related to science, technology, engineering or mathematics.”<sup>4</sup>

*“{Through WIT Job Shadow} I learned even though I’m a woman, I can do whatever job comes to mind ...”*  
 WIT Girls Get IT Job Shadow Participant

At a WIT Girls Get IT-sponsored event at Georgia Tech’s Nanotechnology Research Center, middle-school girls were able to ask questions of undergraduate students participating in the Research Experience for Undergraduates (REU) program. “Many of the Girls Get IT participants told us how much they learned from the REUs, and the REUs were so busy answering questions they didn’t finish their lunches!”

How to connect girls with a STEM role model:

1. Programs like WIT’s Girls Get IT Job Shadow pair girls with mentors, and its Behind the Scenes events and Career Exploration workshops have women in STEM careers available to speak with female students about possible career choices.
2. Contact local universities and companies – they often require a certain number of volunteer hours for their employees. For example, SunTrust Bank in Atlanta participated in the WIT Girls

<sup>4</sup> Halpern, D., Aronson, J., Reimer, N., Simpkins, S., Star, J., and Wentzel, K. (2007). *Encouraging Girls in Math and Science* (NCER 2007-2003). Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education. Retrieved from <http://ncer.ed.gov>.



Get IT Job Shadow program because “at SunTrust, volunteerism is encouraged and recognized as a significant contribution to our community.”

3. Examine your current networks – parents, teachers, friends – and determine women in STEM you can connect with young girls. Encourage older girls to conduct informational interviews with women in STEM.
4. Read biographies about women scientists, engineers and mathematicians.

## Broaden Her Horizons

Very often when girls think of careers related to science, math, and technology they think of engineers with pocket protectors, mathematicians crunching numbers and enormous computer mainframes in the remote basements of corporations.

Often these young girls yearn for something more exciting, more glamorous – and showing them a career in STEM is often much more than looking through a microscope is an excellent approach in inspiring girls to stick with math and science.

“When dad goes to the garage to tinker with the car, he brings his son to show him what’s under the hood, but it very often doesn’t cross his mind to bring his daughter,” says Rocker. “With young girls in particular, they only know what they are being exposed to, and as a community it is critical we open up possibilities for them.”

Susan Solomon of Sherpani Partners, a non-profit organization offering career exploration workshops, says we have to remember girls are learning about potential careers from day one, so it is imperative to start generating interest when they are young.

“Awareness is a key factor in getting girls interested in STEM early in life,” says Solomon. “We only know what we’ve been exposed to, so if our parents don’t know much about technology – neither will we.”

“SunTrust banks participated in a Girls Get IT program for WIT, and the girls were able to see how many different areas technology impact in the bank: they saw the inside of an ATM machine, toured the Atlanta Data Center and toured the SunTrust Robinson Humphrey Trading Floor,” said Rocker.

*“I was amazed at how the world of work was so complex – everyone seemed to be dependent on someone else to get the job done in the most efficient way,”*  
*Participant, Girls Get IT Job Shadow*



“Bringing the reality of the wide variety of technology careers to life for these girls is essential. In WIT, we have patent attorneys, women who focus on technology marketing, CIOs for health care companies, and women who lead human resources efforts for technology companies. We also have engineers, women involved in bioscience and those who are rocket scientists. Creating and hosting programs like Girls Get IT Career Exploration Workshops is a way to connect these girls with real-world examples of women in successful STEM careers.”

A few ways to broaden the horizons of young girls about STEM careers:

1. Have women in technology careers as guest speakers in classroom. These role models can talk to young girls about what they were interested when they were their age, and how they parlayed that interest into their current career.
2. Have girls participate in a local career exploration and job shadow programs. For example, WIT hosts a speed networking event at a local robotics competition so young girls can ask women with careers in STEM questions about their experiences.
3. In young girls, build on current interests and academic successes. For example, if a daughter scores well on a test in fractions, the parent could point out how we use fractions in measurements while cooking dinner – and how scientists in laboratories use similar methods when conducting research.
4. In older girls, use skills inventory testing to discover areas of strength then build on those areas where they have interests. These tests will point toward areas where a career in STEM would be a natural succession, but the girl might not have realized it was a career possibility or that she had a natural ability for it.

## Conclusion

Building girls’ confidence in math and science is critical when it comes to the future of women in STEM. Parents, educators, and the STEM community can take simple steps in encouraging girls to become engaged in and stay enthusiastic about careers in STEM.

Women in Technology’s Girls Get IT programs, which combine the three-point approach to building the confidence of girls in STEM, are proven to be effective. In 2010, TechAmerica Georgia selected WIT’s Girls Get IT program the winner of its Spirit of Endeavor “Leadership in Technology Education” Award.

“Of my students who have participated in a WIT Girls Get IT program, 80 to 90 percent of them are in a STEM program at universities including Georgia Tech or working in a career in a STEM field. And 100



percent of those who participated in WIT Girls Get IT programming say it helped them as they made choices about what they would major in while in college,” says Suzy Crowe of Milton High School.

### **About WIT Foundation**

Founded in 2004, the WIT Foundation is a 501c3 non-profit organization that supports the philanthropic aims of WIT, Inc. The WIT Foundation focuses on pre-career programs, awarding cash grants to area organizations and non-profits focusing on girls and STEM. WIT starts early guiding women in technology toward success, and the WIT Foundation-created Girls Get IT program is a perfect example. Girls Get IT creates a community of female students of all ages, partners them with local professional women in technology, and then helps them make informed decisions about careers in science, technology, engineering and math. Companies including Accenture, AutoTrader.com, Cbeyond, Cisco, IBM, Intercontinental Hotels Group, McKesson, The Coca-Cola Company, and Turner Broadcasting System and have become heroes to young girls through WIT’s Girls Get IT program. For more information on how your company can get involved, contact us at [GirlsGetIT@mywit.org](mailto:GirlsGetIT@mywit.org).

### **About Women in Technology (WIT)**

WIT's mission is to serve as passionate advocates for advancing women in Georgia’s technology community. Each year, more than 1,000 thought leaders and professionals attend WIT Forums, WIT’s leadership and networking series. Through “Careers in Action”, WIT delivers professional development programs such as Executive Readiness, Leadership Foundations, and Success by Design, created to enable women to hone their leadership skills and achieve visibility within the business community. WIT’s philanthropic and educational programs, known as Girls Get IT, collaborate with the business, education, and nonprofit communities to inspire girls of all ages to pursue careers in science, technology, engineering, and math (STEM). WIT has two annual premier events, WIT Connect: Connecting for a Cause (our annual fundraiser) and WIT’s Women of the Year in Technology Awards honoring the women who successfully lead Georgia’s technology community. WIT is a founding society of the Technology Association of Georgia, an umbrella membership organization that serves the Georgia technology community. For more information on WIT and the WIT Foundation, WIT’s philanthropic arm, visit [www.mywit.org](http://www.mywit.org) or email us at [info@mywit.org](mailto:info@mywit.org).

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