Women and Girls in Science, Technology, Engineering, and Math (STEM)

"One of the things that I really strongly believe in is that we need to have more girls interested in math, science, and engineering. We've got half the population that is way underrepresented in those fields and that means that we've got a whole bunch of talent … that is not being encouraged..."

President Barack Obama
February 2013

President Obama understands that increasing the number of women engaged in science, technology, engineering, and math (STEM) fields is critical to our Nation's ability to out-build, out-educate, and out-innovate future competitors. Ensuring the United States is cultivating, supporting, and taking advantage of the full pool of potential talent that the country has to offer is a critical step in preparing us to excel in these high growth fields and industries of the future. Jump-starting girls' interest in STEM subjects, boosting the percentage of scientists and engineers who are women – which rested at a mere 24% in 2009[1] – and giving greater prominence to strong role models is not just the right thing to do, but the smart thing to do.

Understanding the status of women and girls in STEM

Since taking office, President Obama has taken steps to increase transparency around the status of women and girls in STEM fields through the collection and dissemination of critical participation and achievement data. In particular two such reports have shed light on the gains made by girls in math and science, remaining areas of underrepresentation, and the relative earning potential of women in STEM careers versus their non-stem colleagues:

- The Department of Commerce's *Women in STEM: A Gender Gap to Innovation* (August 2011) revealed that, though they represent a mere 24 percent of the STEM workforce, women earn on average 33 percent more when they work in these high-growth fields.

- In June 2012, The Department of Education released a *Gender Equity in Education* snapshot, shedding light on the narrowing gap in girls' participation in math and science courses as well as persisting inequalities in AP test passing.

Engaging and supporting women and girls in STEM

In 2009, President Obama set an ambitious goal: to move U.S. students from the middle to the top of the pack in math and science achievement over the next decade. The key to accomplishing this vision rests not only in raising the number and performance of students currently excelling in STEM subjects, but also engaging girls and other students who are historically underrepresented in these areas.

That's why the Administration's $4.35 billion Race to the Top 2009 competition focused not only on encouraging states to develop comprehensive strategies to improve achievement and provide rigorous curricula in STEM subjects, but also to broaden the participation of women and girls. To achieve this, states applying for these funds received competitive preference if they demonstrated efforts to address any barriers to STEM careers for women, girls, and other underrepresented groups.

[1] *Women in STEM: A Gender Gap to Innovation,* U.S. Department of Commerce, Economics and Statistics Administration, August 2011

Launched in November 2009, the President's *Educate to Innovate* campaign features among its three core pillars a commitment to "expand STEM education and career opportunities for underrepresented groups, including women." Working with teachers, businesses, philanthropists, foundations, non-profits, scientists, and engineers, the campaign has already attracted more than $700 million in financial and in-kind support and partnerships that will help prepare more than 10,000 new math and science teachers.

Meanwhile, agencies across the Administration are taking their own steps to foster partnerships and programs that will specifically augment the number of girls involved in STEM activities:

- For instance, the National Aeronautics and Space Administration (NASA) and the Girl Scouts of the United States America (GSUSA) developed a Memorandum of Understanding through which the two organizations work together to achieve common goals: motivating and encouraging girls to do their best. NASA's presence at the GSUSA annual convention provided an opportunity for 17,000 leaders and girls to experience fun, hands-on NASA STEM activities and inspire them to pursue careers in STEM disciplines.

- As another example, the Department of Education's Invest in Innovation (I3) fund provides competitive grants to applicants with a record of improving student achievement. The program's selection criteria prioritizes schools that support women and girls in STEM, emphasizing the need to increase the number of women and girls teaching and studying STEM subjects, and ensuring that both educators and students receive access to rigorous and engaging coursework, high-quality academic preparation, and opportunities for professional development.

Improving Federal coordination to help support women and girls across STEM education:

The Administration has consistently placed the need to bolster the participation of women and girls and underrepresented minorities at the center of many efforts to improve Federal STEM investment activities.

- In December 2012, President Obama announced a new Cross-Agency Priority (CAP) goal to increase the number of students who receive undergraduate degrees in STEM by 1 million over the next decade. In order to meet this goal, the CAP goal includes a focus on providing educational opportunities and support for women.

- In May 2013, the Administration released its five-year STEM Education Strategic Plan, which included a focus on bolstering the participation of women and underrepresented groups as one of five priority areas for further interagency collaboration.

Encouraging compliance with legal protections for female students and employees in STEM academic departments

Since coming into office, President Obama and his Administration have worked to advance Title IX compliance to ensure that all individuals enjoy the equality of opportunity that the law provides. The Administration continuously strives to provide guidance and support to state and local governments and educational institutions to bolster equal access to educational opportunities in a full range of academic subjects, including science, technology, engineering, and math. On June 20, 2012, the Administration announced new commitments to help institutions better understand their obligations under Title IX and remove barriers to women's participation within STEM fields. Federal agencies have risen to the challenge, and delivered on these commitments:

- In the Fall of 2012, NASA launched MissionSTEM, a comprehensive website that gives NASA grantees access to targeted, specific civil rights technical assistance. Through virtual sessions,

self-compliance resources, and descriptions of promising practices, NASA supports and works with researchers, academic institutions and museums, to pursue innovative ways to increase access to and interest in STEM fields.

- In October 2012, the Department of Education released updated Title IX Technical Assistance to K-12 and post-secondary institutions to explicitly address STEM. The revised Title IX Technical Assistance presentation, made available nationwide to state and local education agencies across the country, now includes information on how institutions receiving Federal financial assistance are also required to ensure equal access to educational programs and resources in STEM fields.

Providing better conditions for women in the workforce

Women today currently earn 41% of PhDs in STEM fields, but make up only 28% of tenure-track faculty in those fields. Reducing the dropout rate of women in STEM careers is especially important in the quest for gender equality because women in STEM jobs earn 33 percent more than those in non-STEM occupations and the wage gap between men and women in STEM jobs is smaller than in other fields.

Addressing the challenges of women in the STEM workforce will require the creation and support of institutional environments that are attractive to women in all stages of their careers.

Program flexibility: Encouraging the propagation of family-friendly practices that allow women to remain in the workforce while balancing the demands of caring for their families is critical. An example of Administration efforts in this domain is:

- On September 26th, 2011, First Lady Michelle Obama hosted an event in the East Wing of the White House to announce the National Science Foundation's Career-Life Balance Initiative. This ten-year effort elevates several successful programmatic policies aimed at creating more flexible environments for grant recipients – including no-cost grant extensions, year-long deferrals for child birth or adoption, and increased opportunities for virtual panel reviews – to a Foundation-wide level. These measures seek to address existing barriers that force women to choose between caring for families and continuing their research.

Facilitating Re-entry: For many women who take time off to care for families, re-entering the STEM workforce can prove challenging but can be aided by programs specifically designed to address these barriers. For instance:

- A National Institutes of Health (NIH) program aids "re-entry" for scientists who have taken time away from laboratory research to raise children or attend to other family responsibilities. Though open to both men and women, over 90% of participants have been women.

Setting the Standard with Exceptional Role Models

The President recognizes the need for more women champions and role models in STEM fields as is evidenced by his appointment of many talented women in senior STEM leadership positions. This includes Department of the Interior Secretary Sally Jewel (an engineer), Director of the Defense Advanced Research Projects Agency Arati Prabhakar (an engineer), and National Oceanic and Atmospheric Administration Acting Administrator Kathy Sullivan (a former astronaut).

Launched in the summer of 2011, the Obama Administration's Women in STEM Speakers Bureau brings role models like these top officials one step closer to their future successors, capitalizing on existing

travel schedules to send these women into communities across the country to meet and inspire girls in grades 6-12. In March 2013, the Office of Personnel Management in partnership with NSF and Techbridge hosted a training session open to these and other Federal STEM employees on how best to engage girls in STEM to ensure that Federal staff responding to the President's call to volunteer in their communities would have the tools needed to serve as role models to this particular population.

Mentoring: Mentorship is an important key to increasing and keeping women engaged in scientific and technical careers. By connecting established role models with nascent STEM professionals, mentoring works to address preconceived notions of these careers as inflexible or inherently male-dominated that may discourage many girls from participating in STEM fields.

- Each year, the President recognizes extraordinary individuals outside the Federal Government who have demonstrated remarkable abilities as mentors in the fields of science, engineering, and math. Among the chief qualifications of the roughly 15 annual recipients of the Presidential Award for Excellence in Science, Math, and Engineering Mentoring (PAESMEM) is demonstrated success in engaging underrepresented groups, including girls, in these technical fields.

- Launched in March 2011, the Department of Energy's Mentoring Program offers monthly mentoring activities that connect women engineers and scientists throughout the DOE with female undergraduates.

- In April, 2012, NASA announced an online mentoring pilot entitled NASA G.I.R.L.S (Giving Initiative and Relevance to Learning Science) that connects women engineers and scientists at the agency to girls across the country.

Training Programs: Along these same lines, in partnership with Spellman College, the Department of Transportation has committed to bringing undergraduates to its headquarters to learn more about engineering in the transportation sector. Programs like these go a long way to ensuring that women pursuing undergraduate degrees in STEM fields have the guidance and support they need to remain engaged and inspired.

Global Engagement

Increasing the representation of women and girls in scientific and technical fields is not only a national imperative, it's a global one. As STEM skills become ever more important in an increasingly interconnected global economy, the potential for progress is enormous. However, the Administration can't be satisfied when more than half the world's population not participating in this progress.

- The Department of Energy's Clean Energy Education and Empowerment (C-3E) Women's Initiative aims to inspire women to pursue studies that will help them participate in the clean energy revolution. This partnership features commitments from seven nations in addition to private and non-profit partners. At the core of this initiative is the C3E Ambassador program that recognizes early and mid-career women in clean energy fields with monetary awards and access to a network of similarly notable female energy professionals.

Additionally, in response to the President's call to action at the 2011 UN General Assembly meeting, Secretary Clinton on September 24, 2012 launched the Equal Futures Partnership. This initiative comprises 22 member countries that pledged to look within their own nations and identify and address barriers to women's economic and political participation. As part of this initiative, U.S. Federal agencies and private-sector collaborators committed to opening doors to women in STEM disciplines and careers,

promoting civic education and public leadership for girls, and expanding support for women entrepreneurs.