"My Amazing Future" Program at INL

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TRTR Meeting September 2013





Idaho National Laboratory



Motivation for Program

- Focus on STEM Workforce Development
- Provide exposure to the Wide Variety of STEM topics
- Increase Potential for Girls', Women's Economic Opportunities
- Show Female Technical Competence and Leadership Role models for girls deciding career paths
- Sustainability for Idaho's Technology Foundation
- Focus on Eighth Graders Before high school curriculum is developed
- Background Research on Education Supports the Need for Similar Programs – All agree that women are underrepresented in STEM careers
 - Girl Scouts of America
 - U.S. Department of Commerce
 - American Association of University Women
 - Georgetown University Center on Education and the Workforce



History of "My Amazing Future" at INL

- Initiated via "Girls in Technology" at College of Southern Idaho in Twin Falls
- CSI asked INL to participate in 2007
 - First year, had about 40 girls
 - Four workshops
 - At INL site
- In 2008 Changed Name to "My Amazing Future"
- In 2010 Added Idaho Falls Girls, Total ~60
- In 2013 Added Pocatello and Blackfoot Girls
 - Total ~110
 - Increased to 13 workshops
- Recognized in SE Idaho Among Science Teachers and Participation is Sought
- Seeking Funding Support for Adding Towns North of Idaho Falls





Background Research

- K. MODI, J. SCHOENBERG, K. SALMOND, "Generation STEM: What Girls are Saying about Science, Technology, Engineering, and Math," Girl Scouts of America, 2012
 - Focus is on why
 - "Regardless of STEM interest, there continue to be barriers associated with STEM interest and involvement.
 - More than half (57%) of all girls say that girls their age don't typically consider a career in STEM.
 - Nearly half (47%) of all girls say that they would feel uncomfortable being the only girl in a group or class.
 - Further, 57% of all girls say that if they went into a STEM career, they'd have to work harder than a man just to be taken seriously."



Background Research (cont.)

- D. BEEDE, T. JULIAN, D. LANGDON, G. MCKITTRICK, B. KHAN, M. DOMS, "Women in STEM: A Gender Gap to Innovation," US Department of Commerce, Economics and Statistics Administration, August 2011
 - "One way to compare men and women in STEM is to see to what extent their STEM earnings premium varies. Our analysis shows that, all else being equal, women in STEM jobs earn 33 percent more than their female peers in other jobs, while the STEM premium for men is 25 percent."
 - "There were 2.5 million college-educated working women with STEM degrees in 2009 compared with 6.7 million men. In the overall labor force, there are 21.4 million women (49 percent of the total) and 22.2 million men who are employed and have bachelor's degrees. 57 percent of female STEM majors study physical and life sciences (medical), while fewer than one-third (31 percent) of men choose these fields. The share of women choosing math majors is also higher than men: 10% women study math versus 6 percent of men. The bulk of men with STEM majors (48 percent) choose engineering degrees, two-and-a-half times the share of women who choose engineering (18%). Equal shares of male and female STEM majors enter computer science."



Background Research (cont.)

- C. HILL, C. CORBETT, A. ST. ROSE, "Why So Few? Women in Science, Technology, Engineering, and Mathematics," American Association of University Women, February, 2010
 - Societal environment plays a large role in girls' self assessments. "By emphasizing that girls and boys achieve equally well in math and science, parents and teachers can encourage girls to assess their skills more accurately."
 - The climate of science and engineering departments at colleges and universities is especially important for women—both students and faculty.
 "College and university administrators can recruit and retain more women by implementing mentoring programs and effective work-life policies for all faculty members."
- A. CARNEVALE, N. SMITH, M. MELTON, "STEM: Science, Technology, Engineering, and Mathematics," Georgetown University Center on Education and the Workforce, October 2011
 - "STEM occupations will grow from 6.8 million to 8 million total jobs by 2018.
 92% of STEM jobs will be for those with at least some postsecondary education and training. For women and minorities, STEM is the best equal opportunity employer."



Women are Underrepresented in Many Science and Engineering Occupations

Percentage of Employed STEM Professionals Who Are Women, Selected Professions, 2008



Source: U.S. Department of Labor, Bureau of Labor Statistics, 2009, Women in the labor force: A databook (Report 1018) (Washington, DC), Table 11.



"Idaho Go-On" Promotional Campaign

- Effort to Motivate Idaho Teenagers to Continue Education Beyond High School
 - 10 High School Freshmen
 - 6 Graduate from High School
 - 4 Start College
 - 1 Graduates from College with a Bachelor's Degree
- Campaign is to Obtain Pledges from Idaho Teenagers
 - Students can earn a badge for completing activities
 - Web based for easy interaction
 - Provides steps that students need to take to prepare for continued education
 - Guidance on high school course selection
 - Calendar reminders for tests, application deadlines
- Community, Parent, Teacher Partnership



"My Amazing Future" Program Summary

- Funding, Grant Applications
- Technical Workshop Development
- School Outreach and Planning
- Sponsorship



- Primary sponsor for organizing committee
- Funding for activities
- Government organizations
- Private companies
- Universities
- Logistics





Workshop Development Guidelines

- Develop the Message for Eighth Grade Level
- Research Indicates that Girls Seek Careers Helping People or "Making a Difference" – Focus the message on how the science and technology career meets those objectives and have societal relevance
- Workshop Leader Needs to be a Good Mentor Likes to teach, challenge, supportive
- Seek Female Workshop Leaders (not required, but preferred)
- Involve Questions in the Interaction Make them think
- About 45 Minutes for a Workshop
- Must be Hands on Activity Not a lecture
- Provide a Variety of Topics
- Have Fun!





2013 Workshops

- Cyber Security Games
- Dancing Craisins
- DNA and Microorganisms
- Experiment with a Chemist
- Explosive Volcanism
- Magneto Science
- Nuclear Forensics: The Science
 of Discovery
- Nuclear Space Batteries



- Our Amazing Aquifer: Protecting Our Most Precious Resource
- Radiation and Life
- Robotics and Applied Engineering
- Traveling Roadshow: The Physics of Carnival Games
- Wave your Wand in a CAVE





School Outreach

- Determine How Many Girls can be Hosted Before Inviting Schools
- Contact Local Schools, Starting with Principal, to Determine Interest in Program and Gain Support for Scheduling
- Contact the Teachers and Communicate Program Science teachers
 - Interested in participating
 - Need "nominations" from teachers to get girls who have both the interest and aptitude in STEM topics
- Need Continuing Repeat Meetings/Phone Calls as Constant Reminders for Sign-ups, Logistics, Permission Slips, Security Forms, etc.
- Listen to Feedback from Schools in Developing Program Schedule and Logistics



Logistics

- Obtaining Space in Facilities to Host Workshops
 - Laboratories
 - Conference Rooms
 - Outside or Inside?
- Security Issues in Workshop Facilities
- Tour Guides or Chaperones (Security Escorts)
- Transportation
 - Needed between schools and event venue?
 - Between variety of event venues?
- Food and Drinks
 - Need to host breaks, lunch
 - Dinner if it's a long day
- Keynote Speaker for Lunch
- Printed Program
- Handouts/Giveaways
- Feedback Ask during the day





Sponsors for INL's MAF







SECTION





American Nuclear Society





Center for Advanced Energy Studies





College of Science and Engineering







Printed Program





"My Amazing Future" Summary

- Critical to Gain Support from Schools for Participation
- Workshop Development Needs to be Geared to Audience
- Start Early on Budget and Funding Planning
- Event Organizing Committee Simplifies and Spreads Work Around
- Seek Feedback from Both Students and Teachers
 - "All the girls expressed enthusiasm and interest, and a desire to keep taking science and other classes that would prepare them for STEM careers."
 - "All of this engineering stuff is really cool. It's really changing my mind about what I want to do. I like doing things with my hands and I've learned a lot about what kind of careers are out there."

