

**GIRLS EXPLORING SCIENCE, ENGINEERING &
TECHNOLOGY EVENT**

NOVEMBER 5, 2008

Hosted by:

The Society of Women Engineers (SWE) Rocky Mountain Section
Lockheed Martin
Junior Achievement - Rocky Mountain Inc.
Agilent Technologies
URS-Washington Division

FINAL REPORT

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Table of Contents

| | |
|--|----|
| Executive Summary..... | 3 |
| Major Findings..... | 3 |
| Background and Methodology..... | 4 |
| Survey Findings..... | 5 |
| ▪ Participant Profile..... | 5 |
| ▪ Outcomes..... | 5 |
| ▪ Perceptions, Attitudes and Opinions..... | 8 |
| Recommendations..... | 12 |
| Conclusions..... | 14 |
| Appendices..... | 14 |
| ▪ Appendix A: Budget..... | 15 |
| ▪ Appendix B: Workshops..... | 16 |
| ▪ Appendix C: Student Survey..... | 23 |
| ▪ Appendix D: Adult Survey | 25 |
| ▪ Appendix E: Most and Least liked workshops | 27 |
| ▪ Appendix F: Adult Comments for Improvement | 30 |

Executive Summary

Gender biases and stereotypes may steer today's girls away from careers or interests in the fields of math, science, engineering, computers and technology. This conference is striving to change that reality. Girls Exploring Science, Engineering and Technology (GESET) providers want girls to walk out of the event inspired by the wonders of science, engineering and technology as well as the people who work in these fields.

The GESET 2008 Event's objectives were to:

- Introduce female 6th and 7th grade students to real world aspects of math, science, engineering, technology and to the many diverse fields available.
- Give female middle school students, their parents, teachers and counselors a chance to interact with engineering and technical professionals to see how science, engineering and technology can be fulfilling and fun.
- Introduce networking and mentoring basics to female middle school students.
- Introduce students, parents, teachers and counselors to local organizations within the science, engineering and technology community and available resources.
- Provide an opportunity for local corporations, their employees and the community to come together and support students to succeed in math and science.
- Help students see a clear connection between the skills that science, technology, engineering and math (STEM) classes offer and real life careers.
- Motivate students to take STEM classes in high school.
- Inspire students to pursue STEM careers.

In connection with the objectives above, the GESET event was successful. Confirmed registrations totaled **1448** students, filling all available spaces for attendees. GESET connected **43** public schools from **12** school districts and **9** private/parochial/online schools with **200** workshop presenters, **150** guides and **20** committee participants all focusing on informing and inspiring girls to explore science, engineering and technology options. This event assembled a wide variety of workshops and potential adult mentors for the student participants, schools and supporting adults attending GESET.

Major Findings

- 99.3% of students were either in 6th or 7th grade.
- 65.4% students said after attending this event, they have a clear connection between the skills that these classes offered in science, technology, math and engineering, and real-life careers.
- 50.7% of students agreed that they were confident they would enjoy a career in science, engineering or technology.
- 44.5% of students said they learned what high school classes they should take at the GESET event in order to have the option to enter the fields of science, engineering and/or technology.
- 51.4% of students said being at the GESET conference made them want to take more science, technology, math and engineering classes in high school.

- 42.5% of students said being at GESET inspired them to have a job in science, engineering or technology.
- 88.5% of students said they would come back to this event next year.
- 51% of students are considered promoters of GESET- they have rated the event a 9 or 10 (scale 1-10, 10 being they would definitely recommend this event). Promoters generate enthusiasm and excitement about GESET. 28% of students rated GESET a 7 or 8 which is considered neutral. These students most likely enjoyed their experience, but may not see their friends enjoying their experience as much as they did.
- 49% of GESET students said they learned about jobs or opportunities they had never heard before the conference. 44% of students relayed that they did not learn about new jobs, but may have learned more in-depth information about the positions or careers they were interested in.

Background and Methodology

Both the student and adult surveys administered by Junior Achievement - Rocky Mountain Inc. serve to evaluate the effectiveness of meeting the goals and objectives set forth by the GESET committee. Furthermore, the results are used to understand the orientations and attitudes of the students and adult supporters to better understand how to adapt the content and curriculum to make a deeper, more profound impact on the students.

969 students completed either in full or in part, a two-page survey. This surpassed our goal of gaining a 95 percent confidence level with less than a 5 percent margin of error. This survey used elements from last year's survey to keep some data aligned for continuous comparisons from year to year. However, this survey has been modified to incorporate new questions in order to elicit new information.

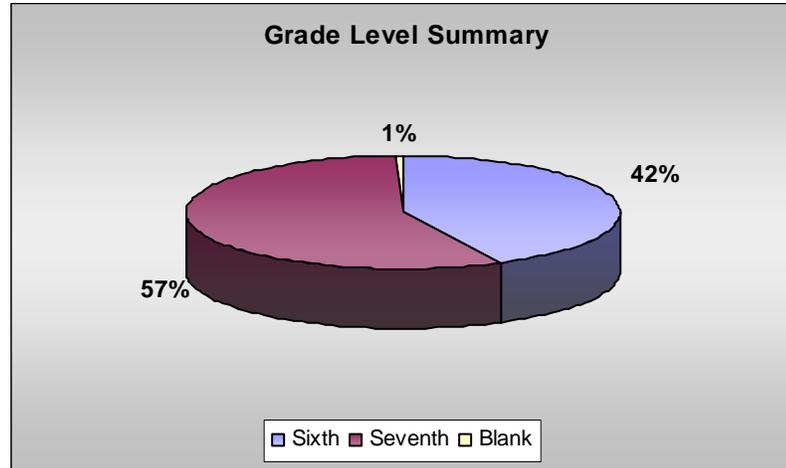
Only 71 adult supporters (workshop presenters, industry volunteers, guides, teachers or chaperones) completed the adult survey. This offered a much lower level of statistical relevance and will be used more as testimonial and lessons learned. Both student and adult survey dissemination and collection can and should be improved in future years.

Survey Findings:

Exhibit 1

Participation Profile:

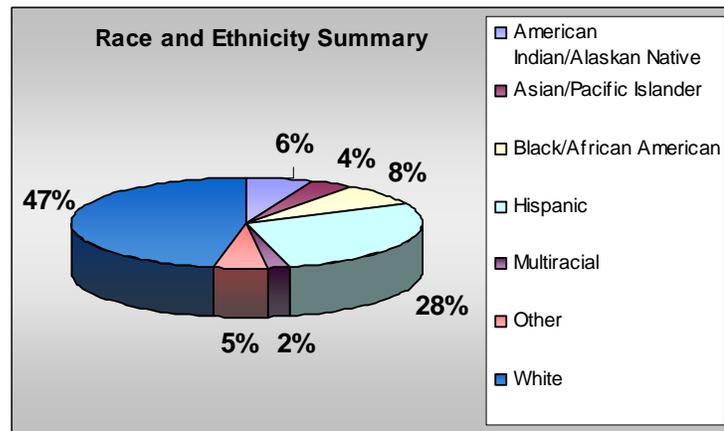
The Society of Women Engineers (SWE) invited female students in 6th and 7th grade who are interested in math, science, engineering and technology to participate in the



GESET conference, which is free for all participants. GESET targets this age group in hopes to encourage them to keep their career options open by taking math, science, engineering and technology

courses in high school. The GESET 2008 conference attracted girls from 12 different school districts. Denver Public Schools accounted for 29 percent of GESET participants followed by Jefferson County Schools-17 percent and Littleton Public School- 15 percent. Student participants varied in race and ethnicity. 53% were from minority backgrounds including 28% Hispanic. (See Exhibit 2).

Exhibit 2



Outcomes:

The major objectives of GESET were to:

- Introduce female 6th and 7th grade students to real world aspects of math, science, engineering and technology and to the many diverse fields available.
- Give female middle school students, their parents, teachers and counselors a chance to interact with engineering and technical professionals to see how science, engineering and technology can be fulfilling and fun.
- Introduce networking and mentoring basics to female middle school students.
- Introduce students, parents, teachers and counselors to local organizations within the science, engineering and technology community and available resources.

- Provide an opportunity for local corporations, their employees and the community to come together and support students to succeed in math and science.
- Help students see a clear connection between the skills that science, technology, engineering and math (STEM) classes offer and real life careers.
- Motivate students to take STEM classes in high school.
- Inspire students to pursue STEM careers.

GESET succeeded in helping participants see the connection between school and career. 65.4% students either agreed or strongly agreed that after attending this event, they saw a clear connection between the skills that these classes offered in science, technology, math and engineering, and real-life careers. Approximately a third (30.9%) of the survey participants rated this neutral leaving less than four percent to disagree or strongly disagree that this event helps illustrate the connection between school and career options.

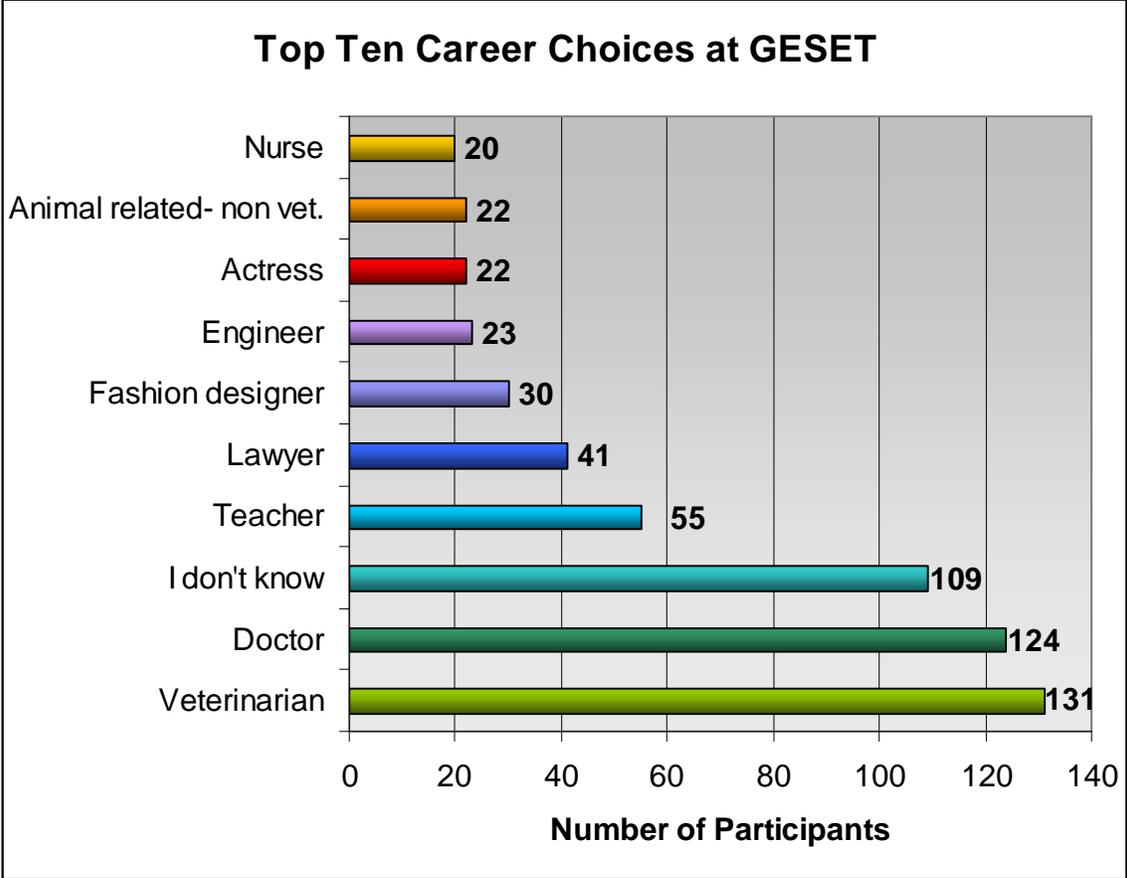
More than half of the students (51.4%) agreed or strongly agreed that attending the conference made them want to take more STEM classes. Less than 15% of participants disagreed or strongly disagreed that the conference made them want to take more STEM classes. Last year, over 22% of survey participants disagreed or strongly disagreed that the conference made them want to take more STEM classes.

Students saw the connection between the skills STEM classes offer and potential careers, however 44.5% of participants agreed or strongly agreed that they learned at the conference which classes to take in high school in order to have the option to enter the STEM fields. This result which was lower than last year's (57.9%) may be due to schools making a more concerted effort to help students learn how to be successful in these careers. This result could also be because workshop presenters were not explicitly told to relay this information to the students.

A key element of this conference was to inspire students to pursue STEM related careers. 42.5 percent of student participants agreed or strongly agreed that being at the conference inspired them to pursue a career in science, technology or engineering. Nearly 40 percent of participants remained neutral up almost 20% from last year. Last year 11.2% of participants responded not at all likely to pursue a STEM career decreased to 4.3% this year. Although the data is much different from last year, it appears this year's student participants are much more centralist in answering questions compared to last year's participants. The data reflects a much closer connection to the 2006 results.

The survey asked student participants what careers they would like to have. Responses show a diverse range of answers. The top ten answers are displayed in *Exhibit 3*. When asked why they wanted to have these careers, the top five responses were: Making money with 22.9% of student participants noting this, followed by Helping people (21.5%); Other reasons (19.2%); Help animals (16.0%) and finally to create and design things (11.3%). Less than ten percent of the population cited a different reason for the career they chose.

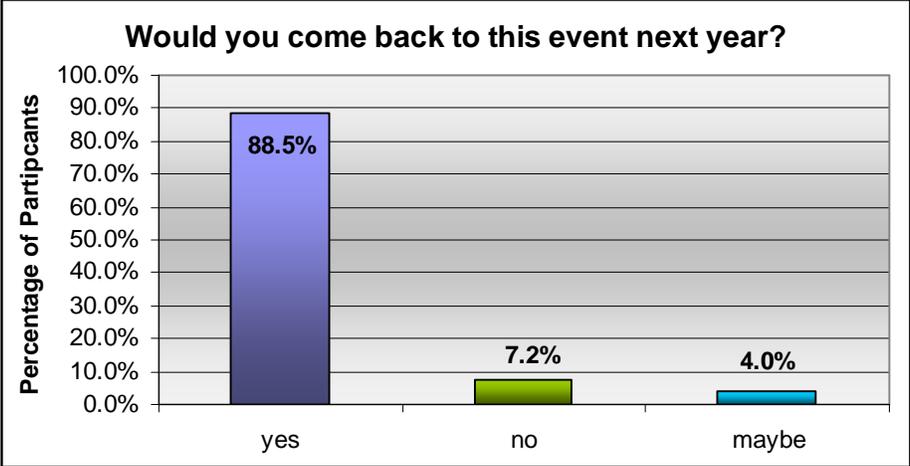
Exhibit 3



GESET was successful in exhibiting many STEM careers and career professionals. The overall goal of introducing STEM related fields and exciting the students was clearly met.

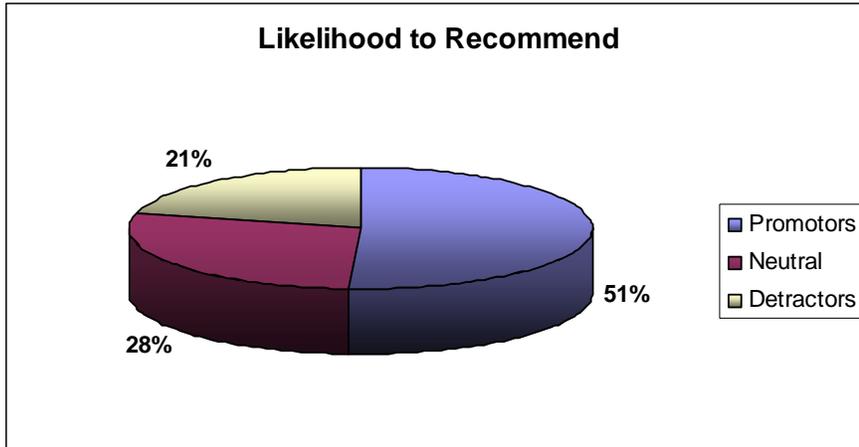
According to participants more than 88% confirmed they would like to return to the event next year.

Exhibit 4



Last year, the survey asked if participants would tell other girls to come. An overwhelming 94.4% said they would tell their friends to come to GESET. This year's survey question expanded on that knowledge and asked the question what was their likelihood to recommend the program to a friend on a Likert scale of 1 (NO WAY!) to 10 (Definitely!). 51% of students are considered promoters or GESET- Promoters and rated

Exhibit 5

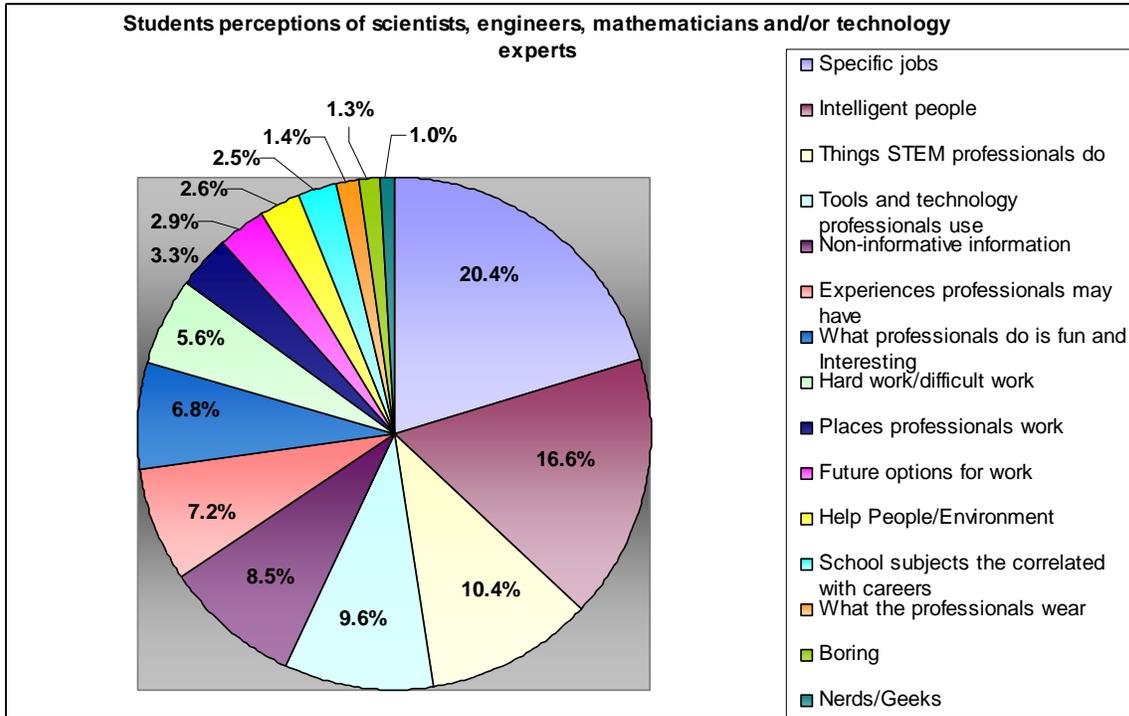


the event a 9 or 10 (scale 1-10, 10 being they would definitely recommend this event to their friends). Promoters generate enthusiasm and excitement about GESET and want to share what they learned with the masses. 28% of students rated GESET a 7 or 8 which is considered neutral. These students most likely enjoyed their

experience, but may not see their friends enjoying their experience as much as they did. 21% of participants are considered detractors of the event. These are students who may not have wanted to come and will tell others that it is not worth their time. There are many reasons they may detract others from coming or enjoying the event while there. This detraction rate is something to pay attention to and possibly use to determine the invitees of future events. Overall, the likelihood to recommend rate is high and one that most companies or organizations would aspire to have. This further exemplifies the appreciation, success and loyalty that GESET participants have for the conference.

Perceptions, Attitudes and Opinions:

We were able to ascertain more information about the girls' perceptions and attitudes towards science, technology, engineering and math. The overall majority of student perceptions with regard to professionals in STEM careers were overwhelmingly positive. 20% of students named a specific person or job when they thought about professionals. More than 15% said they thought of smart or intelligent people. Others noted things they think STEM experts would do, use, experiences they would have or where they might work. Many thought that STEM professionals' work is fun and exciting while others thought it would be a lot of hard work. Still others thought about helping people and the environment, as well as school subjects that will help them enter a STEM career. Some students did not have any perceptions of these professionals. Less than three percent had a negative perception of STEM professionals.

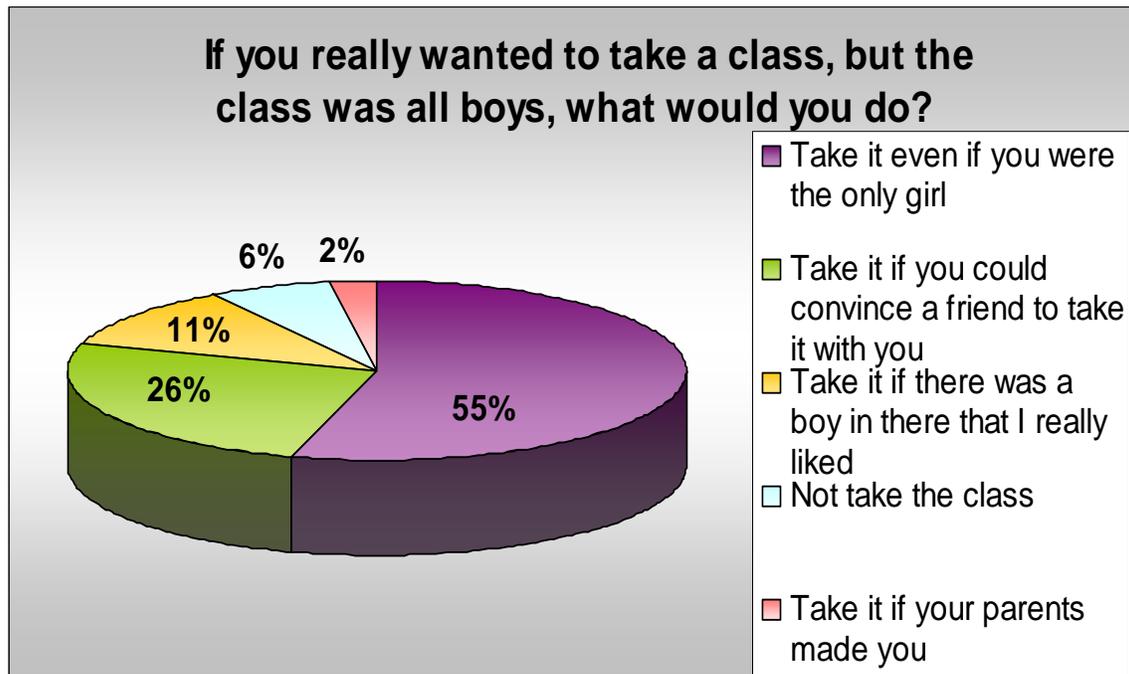


Realizing that the majority of student’s perceptions are positive or at least neutral, it would appear that GESET will have an easier time encouraging females to enter the fields of science, technology, engineering and math. Behavioral scientists say one must first shift knowledge, attitudes, beliefs and finally behaviors will shift. GESET is helping move the perception and knowledge of what females can do in the STEM world.

The majority of girls have positive perceptions of STEM professionals, 50.7% of participants are confident they would enjoy a STEM career. 33.0% of students remain neutral, and not able to say they are confident they would enjoy a career in related fields. Only 16.2 percent disagree or strongly disagree, meaning they are confident they would not enjoy or pursue a STEM career.

In the past, GESET surveys suggested that girls may deter from taking STEM courses in school because they may be the only female in the class. The results from last year’s and this year’s survey are very similar demonstrating that being in a classroom with all boys is not as large a deterrent as some have previously thought. More than half the participants said they would take a class even if they were the only girl in the class. Another 26% said that they would take the class if they could convince a friend to take it with them. However, many of the respondents who put another option before taking the class even if they were the only girl, listed the steps they would take and ultimately, the majority of the girls would take the class even if they were the only girl; many attempted to have friends in the class with them.

Exhibit 7



This survey also considered if parental role models play a substantial role in the perceptions and opinions of STEM careers. The majority of student participants (48%) did not have a family member who worked in science, technology, math or engineering fields. 30% of the students did have family members in these fields. 22% either left this blank or were not sure if their parents' jobs were in these fields. Of the thirty percent of students who did have family members in STEM related careers, 49% of students mention a male family member, 15 percent mention a female family member, 7% mention both and thirty percent did not identify the sex of their family member. This demonstrates that there is still a major need for young girls to have strong female role models in STEM fields and validates the importance of this annual conference.

Workshops

The conference sends out invitations to middle schools to attend the conference. The invitation tells the teacher/principal/counselor when they can register. Once the teacher registers, they can start enrolling students (there was no limit of students each school could bring). GESET participants have the opportunity to take either three 45 minute sessions or two 70 minute sessions during the conference. Due to the first come first serve basis some students are not able to select a workshop aligned with their interests. Noting this obstacle, it is important to remember that participants may not have participated in the workshop of their choice hence, affecting the workshop ratings. Workshop ratings are limited and based upon the 2-3 workshops each student experienced.

Almost every workshop was mentioned as being both the most liked and the least liked workshop (See Exhibit 8). When ranked by the number of “best” mentions the list’s highest ranking was All (couldn’t decide); Heart Dissection with 42 mentions, and the lowest Oil and Gas Exploration without a single mention. The next ten workshops in ranking order are: Separating Blood to Save Lives; Forensics and Food Mystery; Gumdrop Domes and Paper Bridges; Living in Space; Electronics Lab; What a Brain; ? (Don’t Know); Circuits and Logic.

The number of “worst” mentions was topped by “None” at 178 mentions suggesting many of the girls thought all sessions were worthwhile. The ten ranking least favorite workshops mentioned following “?” (Don’t Know) were: Our Ever Expanding Universe; Electrical and Computer Engineering Careers; Lego Robots; Oil and Gas Exploration; Let’s Go To Water world; Infrared Fun; Star-lab Planetarium; Structural Shakedown. The low ranking for Lego Robots may have been due to the failure of the computers to communicate with the robots.

A deeper examination of the data demonstrates that cross-referencing data (subtracting the number of worst mentions from the number of best mentions) offers a more accurate portrayal of the ranking of each class. (See Appendix D) This process is also limited because the numbers of participants in each session were different. The ten classes mentioned most included: All (55), Heart Dissection (34), Living in Space (26), Forensics and Food Mystery (23), Gumdrop Domes and Paper Bridges (23); Separating Blood to Save Lives (22), Solar Cars (22), Circuits and Logic (20), Eggstraordinary Landers (20), What a Brain (19).

Exhibit 8

| Classes liked most | |
|---|------|
| All | 65 |
| Heart Dissection | 42 |
| Separating Blood to Save Lives | 39 |
| Forensics and Food Mystery | 34 |
| Gumdrop Domes and Paper Bridges | 32 |
| Living in Space | 32 |
| Electronics Lab | 30 |
| What a Brain | 30 |
| ? (Don't Know) | 28 |
| Circuits and Logic | 28 |
| Classes liked least | |
| None | -178 |
| ? (Don't Know) | -44 |
| Our Ever Expanding Universe | -36 |
| Electrical and Computer Engineering Careers | -34 |
| Lego Robots | -31 |
| Oil and Gas Exploration | -27 |
| Let's Go to Water World | -26 |
| Infrared Fun | -25 |
| Starlab Planetarium | -19 |
| Structural Shakedown | -19 |

Adult Perceptions of GESET

On the scale of 1 (terrible) to 5 (great), the average adult rating for the GESET conference was 4.19 (between good and great).

The overall perception from the adult surveys was that the GESET conference is on track for helping students learn about their opportunities in STEM careers. When asked about the length, the content, the number of girls in each workshop, the overall number of girls

in the event and the overall number of workshops, a majority of survey participants (more than 70%) replied that the areas were “good”, that is not too many or too few, not too hard or too easy, but just right. Adult participants noted a few areas where the conference excelled. When asked about the quality of activities, 86% of participants said the event was either good or outstanding. Over 87% of participants thought the organizers and volunteers at the conference were either helpful or very helpful. Also, 85% of participants thought the presenters’ interaction with the girls was good or outstanding. Survey participants did not note any areas needing major improvement.

Survey participants also said that they knew about GESET in plenty of time, that registering was simple and check-in was a fast process.

An area that adult participants rated lower was the conference’s ability to help participants develop a stronger network of professionals in science, technology and engineering fields. This was the lowest rating (3.48-between neutral and good) from the adult surveys.

Survey participants were asked to comment on the greatest barriers to GESET participants choosing to take science, math and/or technology classes. The responses varied however, the top reasons selected were: cultural and societal attitudes, peer attitudes and pressures followed by the girls’ lack of interest. These are areas that GESET is working to break the stereo-types by offering real-life women role models in STEM jobs and helping to create interest in the jobs. Adults thought the most important reasons for girls to be at this conference were to: engage them with hands-on activities, help them learn about new things and about new career opportunities, and interact with a network of professionals in the areas of science, technology, engineering and mathematics.

Recommendations

Student Recommendations

This conference wants to help girls explore STEM related fields and opportunities. In order to find out how to help future presenters make a more profound impact on the students, the survey asked participants what they would do to make the event better for next year’s participants.

There were four categories of comments that accounted for over 50 percent of the remarks. The most commented category (16%) was having more hands-on activities. Participants really appreciate the hands-on activities and want to see more workshops where they can apply what they learned and participate in a controlled activity. Almost as many of the girls (15%) said they would not like GESET to change. Others did not know what could be done differently (13%). The final group, accounting for 12%, said they would like more activities.

Many of the girls mentioned behavior changes they would change next year. They mentioned paying more attention, talking less, learning more about the subject matter before the conference and bringing paper and pencil so they could take notes during the conference. They also said they would have selected different workshops.

Participants also mentioned changing the time (often wanting the day to be longer and the workshops to be longer). Others mentioned they wanted the conference to stay on schedule as the conference introductions went on longer than scheduled. Participants reached their first session late which diminished the time they were able to spend working with adults.

Students would like to have more handouts and give-away items from their workshops. Some students mentioned explicit information for their workshops. Others made generalized comments that they would like the conference to be more fun and/or exciting.

Last year the participants mentioned they thought boys should be able to attend the conference. Some comments resonated with that this year. Participants also said they would like to work with people they knew.

The final areas that students mentioned were to be better organized and prepared. One suggestion was to give maps to the girls so they could find their own way around the convention center. There were also a few mentions about food and snacks- they would like the opportunity to eat a snack during the conference or have an earlier lunch. Music was also mentioned—some students would like to have light music playing in the background of the workshops.

Adult Recommendations

The adults offered more depth and suggestions in their recommendations. A detailed list of recommendations can be found in Appendix E.

Adults would like to have more information on their roles. Guides would like to have more time with their students to relate their skills and careers with the girls. Guides and volunteers also would like more direction regarding what to do and how to get the girls in their groups from place to place. Many comments made it clear that the adults would like to have the roles, responsibilities and requirements sent to them via email before the event.

Many adults noted how important it is to stay on time with the speakers and events. Due to the delay in the welcoming session, the first workshops were shortened twenty minutes and took away from the girls' experiences.

The sound system was another major issue that left much to be desired. Participants could barely hear what the speakers were saying during the presentations in the Korbell Ballroom.

Others mentioned the activities and the time in the workshops as something to improve. One idea was to review the curriculum before it was presented at the event because some of the material was “too difficult” or “boring” for the students. A more active-participation curriculum would be preferred in an event like this.

Conclusions

The objectives set forth for the Girls Exploring Science, Engineering and Technology (GESET) 2008 Event were met. This conference successfully introduced female sixth and seventh graders to real world aspects of math, science, engineering and technology by highlighting many diverse fields and careers available. GESET created a collaborative event where schools, parents, and professionals could interact for a common purpose.

Women in STEM careers are still in short supply. Conferences like GESET enable students to work with professional women while experiencing interactive activities. This encourages and prepares them for careers in these fields which will help lessen the dearth of women in these fields. It is imperative to learn from past years' event participants on how to improve the event and make it more meaningful for future GESET participants.

Appendix A: Budget

| Society of Women Engineers | | | | | |
|---|--|---------------------------------|---------------|------------------------|---------------|
| Girls Exploring Science Engineering & Technology | | | | | |
| Approved Budget FY '09 | | | | | |
| | | 2008-'09 Approved Budget | | 2008-'09 Actual | |
| | | Expense | Income | Expense | Income |
| General | | | | | |
| | Venue/Convention Center | \$16,000.00 | | \$ 13,273.50 | |
| | Catering/Centerplate | \$40,000.00 | | \$30,955.52 | |
| | AV Equipment & Services/Elite Expo | \$14,000.00 | | \$ 3,594.00 | |
| | Security/Contemporary Services Corporation | \$ 200.00 | | \$ 200.90 | |
| Copying/Printing/Postage/Mailing | | | | | |
| | Copies and Mailing | \$ 400.00 | | \$ - | |
| Workshops/Presenters | | | | | |
| | Workshops | \$ 125.00 | | \$ 465.00 | |
| | Computers for Workshops/CCR | \$ 5,000.00 | | \$ 9,470.00 | |
| | Supplies | \$ 500.00 | | \$ - | |
| | Gift Cards | \$ 1,225.00 | | \$ - | |
| | Presenter Parking Reimbursement | \$ 200.00 | | \$ - | |
| | Event Recap Meeting | \$ 50.00 | | \$ - | |
| Miscellaneous | | | | | |
| | Elych's Tickets for Giveaway | | | | |
| | Larabars | | | | |
| Income | | | | | |
| | Xcel Grant | | | | \$ 236.32 |
| | Macy's Day Ticket Sales | | | | |
| | Donations from outside sources/companies | | 63,500.00 | | \$62,340.00 |
| | Balance Carry Over From Previous Year | | \$ 8,000.00 | | \$ 1,802.69 |
| Total | | | | | |
| | | Expense | Income | Expense | Income |
| | | \$ 77,700.00 | \$71,500.00 | \$ 57,958.92 | \$ 64,379.01 |

Appendix B: Workshops

GIRLS EXPLORING SCIENCE, ENGINEERING & TECHNOLOGY

November 5, 2008

WORKSHOP DESCRIPTIONS

Animal Crossings, Jessica Myklebust, Environmental Scientist, and employees of Felsburg Holt & Ullevig, www.fhueng.com

Girls work in groups integrating engineering and science to design and simulate effective animal crossings.

All presenters have a passion for the environment and wildlife.

Biomass to Biogas, Rick Shin, Science Coordinator, National Renewable Energy Laboratory, www.nrel.gov

Students learn about the potential to use waste products to meet the demand for liquid fuels and industrial chemicals. They construct potato powered clocks using zinc and copper metals learning about series and parallel circuits.

Rick has degrees in math, earth science and education and a wealth of experience teaching middle school students.

Build a Bot!, Kristen Jensen, Youth Programs Assistant Coordinator, Denver Museum of Nature & Science, www.dmns.org

Girls learn about robots working in space, then form small groups to build a robot with motors and moving parts.

Kristen has a degree in anthropology and both teaches and develops science programs.

Catapult Capers, Agilent employee volunteers, Agilent Technologies, www.agilent.com

Girls build simple catapults and use them to observe, predict and measure the distance that objects are propelled by their machines.

Agilent Technologies works to inspire minds and enrich lives in local communities by supporting programs that increase student interest and achievement in science. Workshop volunteers are technical and support employees.

CBI Forensics, Amy Miller and Carrie Thor, Agents, Colorado Bureau of Investigation, www.cbi.state.co.us

Girls investigate a mock crime scene, test their powers of observation, learn about handwriting impressions, DNA analysis and fingerprints.

All presenters have degrees in chemistry or biology and work as specialized Laboratory Agents in Denver.

Circuits & Logic, Janeen Sharma, Human Factors Engineer, and Heather Cuddeback, Software Engineer, Northrop Grumman, www.northropgrumman.com

Girls learn the basic science behind circuitry and create several circuits activating several devices.

Janeen and Heather have degrees in math, industrial engineering and computer science.

Classification Keys, Jennifer Talagrand, Instructor, Science form CU/CU Science Discovery, www.colorado.edu/sciencediscovery

Students work in teams and use a key to identify several mammal skulls. They then develop a classification scheme for plant samples.

Jennifer is an experienced teacher with degrees in natural resources and environmental leadership.

Climate & Sustainability, Teri Eastburn, Coordinator, and Kyle Mumford, Science Educator UCAR/NCAR Office of Education, www.ucar.edu

Girls learn about the carbon link, examine graphs of historical data and play a game to find ways to reduce carbon emissions in the most cost-effective ways possible.

Teri and Kyle have degrees in human development and meteorology and work for the Public Visitor and Education Programs at NCAR.

Computer Game Creation, Tom Marx, Owner, Bits, Bytes and Bots, LLC, www.bitsbytesbots.com

Girls use laptop computers to create a video game that they take home on a CD.

Tom was a software developer for 10 years before founding Bits, Bytes and Bots.

Computer Pieces and Parts, Angie Blackwell, Sr. IT Manager, Junior Achievement, www.jacolorado.org

Girls take apart scrapped computers to learn about the hardware components that make a PC work and determine which one is missing.

Angie has a BA in history and has done coursework at several local community colleges in order to maintain and repair a computer network servicing 25 people in several locations.

Construction Engineering & Management Careers, Marsha Nelson and Caryn Becker, Mortenson Construction, www.mortenson.com

Students rotate through two stations learning about surveying equipment and mixing mortar trying their hands at both.

Marsha and Caryn have degrees in civil, construction and mechanical engineering.

Dive Into Athletic Training, Darryl Miller, Sports Medicine/District Athletic Trainer and students from CEC Middle College - Denver Public Schools, www.dpsk12.org

Students practice evaluating injuries, take turns taping and bracing each other, and learn about injury prevention, treatment and rehabilitation.

Darrell has degrees in industrial education, physical education and exercise physiology, and is an EMT. He is also an athletic trainer for the USA Wrestling team.

Eggstraordinary Landers, Mark Bigler, Mechanical Products Manager, and Lockheed Martin employee volunteers, Lockheed Martin, www.lockheedmartin.com

Students design, build and test a system to protect an egg from a 10 foot fall using simple materials such as cardboard, tape and cotton. Landing craft are tested for egg survival rates.

Employees have a variety of engineering degrees and are eager to share their knowledge with young people to build incredible landers.

Electrical and Computer Engineering Careers, Karen Ungerer, Recruiter and Retention Coordinator, Colorado State University, www.engr.colostate.edu/ece

Girls learn about engineering careers that benefit the environment, improve health, safety and well-being, and the design and development of consumer products.

Karen has an education degree and works as a program coordinator and assistant to an associate dean of international research.

Electronics Lab, Fred Gluck, Instructor, Science from CU, www.colorado.edu/sciencediscovery

Hands-on workshop introduces basic electronics and electronic components. Students work in pairs to perform experiments, and design and implement their own circuits.

Fred is an engineer with degrees in mathematics, electrical engineering and computer science. In addition to teaching, he volunteers in Boulder public schools teaching and tutoring math and science.

Forensics and Food Mystery, Cynthia Corley, Research Chemist, United States Air Force Academy, www.usafa.af.mil

Students conduct a forensic investigation of a murder case involving poisoning. Testing enables them to determine the poisoned food type and deduce the murderer.

Cynthia has a B.S. degree in chemistry and works on research projects at the Academy.

Gumdrop Domes & Paper Bridges, Deb Lasich, Executive Director WISEM Program, Colorado School of Mines, www.mines.edu

In this two-part workshop, students build a dome structure using only gumdrops and toothpicks. Part two involves learning about bridges and building one from everyday materials.

Deb has degrees in sociology, and community and regional planning.

Harnessing Wind Engineering, Linda Lung, Program Coordinator, National Renewable Energy Laboratory, www.nrel.gov

Students build and test their own model wind turbine to understand the engineering behind these machines.

Linda has degrees in social work and psychology. She manages the Department of Energy's Office of Science overseeing its student and teacher programs.

Heart Dissection, Sandra Kohl, School Programs Coordinator, Denver Museum of Nature & Science, www.dmns.org

Students become familiar with the human circulatory system, hear their hearts beat through a stethoscope and then have the opportunity to dissect a sheep's heart.

Sandra develops and coordinates school programs for the Museum.

Hydrologic Cycle of Reservoirs, Cristy Radabaugh, Water Resource Engineer and Joe Tom Wood, Principal, Martin and Wood Water Consultants, www.martinandwood.com

Girls learn about the hydrologic cycle of reservoirs and water storage. They will simulate a year's reservoir activity calculating water inputs and measuring loss.

Cristy and Joe are practicing water engineers. Joe owns Martin and Wood Water Consultants who specialize in water rights and water resource engineering.

Infrared Fun, Suzanne Metlay, Education Programs Manager, Fiske Planetarium, <http://fiske.colorado.edu>

Girls investigate the electromagnetic spectrum, and work with and understand an infrared camera. They test to see what materials are transparent or opaque to infrared radiation.

Suzanne has a Ph.D. in geology and planetary science and oversees all educational programs at Fiske.

Kalimba Thumb Piano!, Agilent employee volunteers. Agilent Technologies, www.agilent.com

Girls build their own thumb pianos learning about vibration, frequency and pitch. Sheet music and encouragement are provided to help them master their new instruments.

Agilent Technologies works to inspire minds and enrich lives in local communities by supporting programs that increase student interest and achievement in science. Workshop volunteers are technical and support employees.

Launching Humans into Space, Lockheed Martin employee volunteers, Lockheed Martin, www.LockheedMartin.com

Girls participate in a launch simulation of the Orion Space Shuttle and problem solving sessions

Volunteers are all engineers at Lockheed Martin, grew up interested in science and math and now are able to apply their interests to the world of space – the final frontier.

Lego Robots, Stacey Fornstrom, Teacher, Thomas Jefferson High School-Denver Public Schools, www.computermagnet.com

Girls learn how to modify and program a robot to obey their every command by working with Lego Mindstorm robots. They create a program, download it to the robot and test their work.

With an extensive background as a software consultant, Stacey now teaches in Denver Public Schools.

Let's Go to Water World, Nikki Randall, Project Manager, and Linsey Chalfant, Project Engineer, Ayres Associates, www.ayresassociates.com

Girls explore the world of water resource engineering and work with a portable demonstration channel (flume) to learn about roadway drainage.

Nikki and Linsey both graduated from Colorado State University with engineering degrees; they work in water resource engineering including urban drainage design.

Living in Space, Carol O'Leary, President/CEO, Challenger Learning Center, www.clccs.org

Participants rotate through centers to engage in experiments exploring the adventures and effects of living in the "final frontier".

Carol has degrees in physiology and science education. She is President of the Colorado Consortium for Earth and Space Science Education.

Make Your Own Aquifer! Kristina Wynne, Hydrologist, Bishop-Brogden Associates, www.bbawater.com

Students learn about aquifers, designing and building one using different sediments of their choice after strategizing to build one that will hold the most water.

Kristina has degrees in environmental science and physical geography. She works in water rights evaluation and data analysis.

Nitrogen Cycle Game, Christine Wiedinmyer, Scientist, National Center for Atmospheric Research, www.ncar.ucar.edu

Girls are given a "passport" and travel to different "reservoirs" within the room to learn how nitrogen travels from system to system.

Christine has several degrees including a Ph.D. in chemical engineering and works as a research scientist at NCAR.

Oil and Gas Exploration, Volunteers from EnCana Oil & Gas (USA), Inc., www.encana.com

Girls interpret a 3d seismic volume using paper versions of data and maps to locate buried treasure such as oil or natural gas deposits.

Volunteers hold degrees in geology and geophysics.

Our Ever Expanding Universe, Bob Shiflet, Lockheed Martin, www.lockheedmartin.com

Girls participate in a living scale model of our solar system to understand the relative size and distances of planets in our solar system in the galaxy.

Bob has degrees in biology, chemistry and computer resources management is a program manager for engineering and professional development.

Primitive Lifeforms on Other Planets, Barbara Sande, Sr. Staff Engineer, Lockheed Martin, www.lockheed.com

Students learn about extremophiles and possible life forms on moons and planets in the solar system. They complete an art project depicting a possible extremophile from elsewhere in our solar system.

Barb is an electrical engineer with an MBA and enjoys working with students.

Process Technology, Chuck Beck, Program Coordinator, Red Rocks Community College, and Heidi Leoni, community volunteer, www.rrcc.edu

Girls create a polymer-like substance similar to silly putty learning the process principles of proper proportions, batch processing and the role that statistics play in manufacturing.

Chuck is a graduate chemical engineer with vast experience in the energy, food, and beverage process industries. Heidi has a masters degree in applied mathematics.

Prosthetic Devices, Mandy Myers, Certified Prosthetist, Owner of Horizon Prosthetics, LLC, www.hzpros.com

Girls become familiar with the human gait cycle and how it relates to making and fitting an artificial leg; other prosthetics will be discussed.

Mandy has a B.S. in Mechanical Engineering from Northern Arizona University and Prosthetic Certificate from California State University in Dominguez Hills.

Rocket Science 101, Barb Kontogiannis, Engineering Project Manager, and Lockheed Martin volunteers, Lockheed Martin, www.lockheedmartin.com

Students learn about rockets, build them from simple materials and launch them with straws measuring the distances traveled.

Barb holds degrees in mechanical engineering and aeronautics.

Separating Blood to Save Lives, Beth Ebmeier, Chemical Engineer, and volunteers from CaridianBCT, www.gambrobct.com

Students learn about the science of blood separation and have an opportunity to practice with a non-blood solution.

Presenters have degrees in mathematical engineering, manufacturing engineering, chemical engineering and industrial engineering. They are engineers, scientists and regulatory specialists.

Solar Cars, Morgan Curley, Intern Coordinator, National Renewable Energy Laboratory, www.nrel.gov

Students construct their own electric cars powered by solar cells.

Morgan has degrees in physics and education with extensive teaching experience.

Sounds of Vibration, Lenny Demchak, Principal Systems Engineer, and Lockheed Martin volunteers, Lockheed Martin, www.lockheedmartin.com

Girls make their own wind chimes learning the basic principles of sound and vibration.

Lenny has a B.S. in aerospace engineering and 33 years experience in structural vibration acoustics and loads.

South Pole Experiments, Kathie Baker, Sr. Systems Engineer II, Raytheon, www.Raytheon.com

Working in groups, girls build telescopes while attired in South Pole clothing. They also learn about science projects being conducted in Antarctica.

Kathie has degrees in meteorology and computer science and several working tours at the South Pole.

Starlab, Staff from Fiske Planetarium, <http://fiske.colorado.edu>

Girls participate in a portable planetarium show exploring the night sky and later the sun followed by some celestial mechanics.

The Fiske planetarium staff have degrees in astronomy and astrophysics.

Structural Shakedown, Kari Sebern, Jamie Ho, Lydia Abarr, Structural Engineers, S.A. Miro, Inc.

Girls work in teams to build a structure out of K'Nex and then test it on a shake table to simulate earthquake activity; they further test their buildings with gravity loads.

All women hold engineering degrees and work as structural design engineers.

The Most Important Issue of Your Generation - Water, Ann-Marie Doerhoff, Environmental Engineer, Water for People, www.waterforpeople.org

Teams of girls race each other in hauling faux water to experience some of the challenges people in developing countries experience every day in obtaining water and treating waste water.

Ann-Marie has degrees in civil and environmental engineering and speaks widely on water issues to all age levels.

The Power of 2, Hilary Pike, Software Engineer, Microsoft, <http://blogs.msdn.com/springboard>

The girls learn about sorting algorithms by sorting themselves. They also explore concepts related to the powers of 2.

Hilary holds degrees in computer science and helps students connect to technology.

The Science Behind Safe Food, Danica England, Supervisor, Retail Food Inspection, Denver Department of Environmental Health.

Girls discuss the factors affecting the safety of food consumed by the public and do an experiment with Glogerm to understand the spread of germs in food preparation and distribution.

Danica graduated from Kalamazoo College in Michigan with a B.A. in Biology and has worked in public health inspection.

Virtual Anatomy, Adam Lawson, Professional Research Associate, Touch of Life Technologies, www.toltech.net

Girls explore the virtual body in three dimensions and see corresponding cross-sections for every millimeter of the human body while using the VH Dissector developed in Colorado.

Adam has degrees in liberal arts and evolutionary psychology while continuing his studies in anatomy and computers.

Water Quality Tests, Dawn Cowell, Chemist, and Volunteers from the City and County of Broomfield, www.ci.broomfield.co.us

Girls rotate among several stations testing water samples to determine the chemical and microbial differences in water quality, and view a presentation on water challenges throughout the Western hemisphere.

Presenters have degrees in several fields including biology and chemistry. All have extensive experience in water quality issues in many countries.

Water Treatment, Sarah Dominick, Engineer, Denver Water, www.denverwater.org and volunteers from: Boyle Engineering, CH2M Hill, Burns & McDonnell Engineering, Carollo Engineers and Church OWC.

Students participate in cleaning dirty water using common water treatment techniques such as coagulation, flocculation, and filtration.

Sarah has degrees in civil engineering and environmental science from the Colorado School of Mines.

Water Wise Landscapes, Wendi Birchler, Principal, Norris Design, www.norris-design.com

Students are given the tools and information required to design a water-wise garden preparing a site plan depicting their design and vegetation choices.

Wendi has a B.A. in landscape architecture and years of experience in landscape projects.

Weather Station Measurements, Agilent employee volunteers. Agilent Technologies, www.agilent.com

Girls build their own weather-proof weather stations and learn how to monitor local weather conditions tracking temperature, accumulated rainfall, wind direction, wind speeds and cloud formations.

Agilent Technologies works to inspire minds and enrich lives in local communities by supporting programs that increase student interest and achievement in science. Workshop volunteers are technical and support employees.

What a Brain, Lisa Treviso-Jones, Speech Pathologist and Marie Andrews, Occupational Therapist, University of Colorado Hospital, www.uch.edu

Girls learn about brain injuries and aphasia. They identify different areas of the brain and their functions, and dissect a fake brain.

Both women have degrees in speech language pathology or occupational therapy and a great deal of clinical experience.

Wildlife Management, Kathi Green and Shelly Morell, Colorado Division of Wildlife, <http://wildlife.state.co.us/>

Girls learn about wildlife habitat and the importance of unpolluted water to wildlife. They lay an aquarium to model an aquifer.

Kathi and Shelly have degrees in several scientific disciplines and educate people about wildlife conservation and management.

Winning at Math & Science, Michele Towers, Life Coach and MESA Director, New Directions Coaching LLC, coaching4newdirections.com

Girls learn through fun activities the 10 keys to succeed in math and science.

Michele is a mechanical engineer with a passion for helping others reach their full potential.

Appendix C: Student Survey

2008 Girls Exploring Science and Technology Event

Dear Student,

Thank you so much for being here today! In order to improve this event for next year's participants we need to hear about your experience in this fall's "**Girls Exploring Science, Engineering & Technology**" event. We value your input and appreciate all the comments you make. When you are done please turn this into your group leader!!

1. What workshop did you like the most? Why?

2. What workshop did you like the least? Why?

Please circle the number below that best represents your opinion on the following statements:

3. Schools offer classes in science, technology, math and engineering. After attending this event, I see a clear connection between the skills that these classes offer, and real-life careers.

1 2 3 4 5
Strongly Disagree Disagree Neutral Agree Strongly Agree

4. I am confident that I would enjoy a career in science, engineering or technology.

1 2 3 4 5
Strongly Disagree Disagree Neutral Agree Strongly Agree

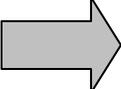
5. Did you learn about jobs or opportunities at this event that you had never heard of before? If yes, what were they?

6. When you think of scientists, engineers, mathematicians and/or technology experts, what comes to mind?

7. What do you want to do when you grow up?

8. Why do you want to do that? (please select the one that applies the most)

- | | |
|--|---|
| <input type="radio"/> Make Money | <input type="radio"/> Lots of women do this |
| <input type="radio"/> Help People | <input type="radio"/> Lots of men do this |
| <input type="radio"/> Create and Design things | <input type="radio"/> Help Animals |
| <input type="radio"/> Teach or Learn things | <input type="radio"/> Other |
| <input type="radio"/> Spend time with people | |

Don't forget the back! 

Today I learned what high school classes I should take in order to have the option to enter the fields of science, engineering and/or technology.

1 2 3 4 5
 Strongly Disagree Disagree Neutral Agree Strongly Agree

9. Being here today makes me want to take more science, technology, math and engineering classes in high school.

1 2 3 4 5
 Strongly Disagree Disagree Neutral Agree Strongly Agree

10. Being here today inspires me to have a job in science, engineering or technology.

1 2 3 4 5
 Strongly Disagree Disagree Neutral Agree Strongly Agree

11. If you really wanted to take a class, but the class was all boys, you would:

Please pick one answer:

- Not take the class.
- Take it if there was a boy in there you really liked.
- Take it if your parents made you.
- Take it if you could convince a friend to take it with you.
- Take it even if you were the only girl.

12. How would you make this event better for next year?

13. Would you come back to this event again next year? Yes No

14. Would you recommend this event to your friends? (circle the answer below)

| | | | | | | | | | |
|------|----|--------|-------|-------|-------|------|-----|------|-------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| NO | No | Not | I | I | I | sure | yes | Yes! | Definitely! |
| Way! | | really | don't | don't | guess | | | | |
| | | | think | know | so | | | | |
| | | | so | | | | | | |

15. Do any of your family members work in Science, Engineering or Technology? If yes, what do they do?

16. What grade are you in? 6th 7th 8th

17. What school do you go to? (optional) _____

18. What is your race/ethnicity? (optional)

- White/Caucasian
- Latina/Hispanic
- Black/African American
- American Indian/Alaskan Native
- Asian/Pacific Islander
- Other

Write other comments here:

Appendix D: *Adult Survey*

2008 Girls Exploring Science and Technology Event

Dear GESET Supporter,

Thank you so much for being here today! In order to improve this event for next year's participants we need to hear about your experience in this fall's "**Girls Exploring Science, Engineering & Technology**" event. We value your input and appreciate all the comments you make. When you are done please turn this in along with the student's surveys. Thank you!

Please circle the number below that best represents your opinion on the following statements:

1. Were you able to develop a stronger network of professionals in science, technology and engineering fields through participation in this event?

| | | | | |
|-------------------|----------|---------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |

2. How would you rate the overall "GESET" experience?

| | | | | |
|----------|------|---------|------|-------|
| 1 | 2 | 3 | 4 | 5 |
| Terrible | Poor | Neutral | Good | Great |

3. **PRE-EVENT**

| | | | | | |
|--|-------------------|---|---------|---|----------------|
| | Strongly Disagree | | Neutral | | Strongly Agree |
| | 1 | 2 | 3 | 4 | 5 |
| a) I knew about the event in plenty of time. | 1 | 2 | 3 | 4 | 5 |
| b) Registering for the event was simple. | 1 | 2 | 3 | 4 | 5 |
| c) Check-in was a fast process. | 1 | 2 | 3 | 4 | 5 |

Additional Comments:

4. **EVENT:** How would you rate...

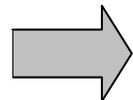
| | | | | |
|--|--------------------|---------|---------------|-----|
| a) the length of the workshops? | Too Short | Good | Too Long | N/A |
| b) the content of the workshops? | Too Simple | Good | Too Difficult | N/A |
| c) the presenters' interaction with the girls? | Poor | Good | Outstanding | N/A |
| d) the number of girls in each workshop? | Too Many | Good | Too few | N/A |
| e) quality of activities? | Poor | Good | Outstanding | N/A |
| f) the helpfulness of the organizers and volunteers? | Not Helpful at all | Helpful | Very Helpful | N/A |
| g) the overall number of girls at the event? | Too Few | Good | Too Many | N/A |
| h) the overall number of workshops? | Too Few | Good | Too Many | N/A |

Additional Comments:

5. If you were planning this event for next year, what improvements would you make?

6. What do you *hear* girls saying are their greatest barr science, math and/or technology classes?

Don't forget the back!



7. What do you *believe* is the greatest barrier to girls choosing to take science, math and/or technology classes?

Girls Exploring Science, Engineering & Technology Event 2008 Final Report

- Peer attitudes/pressure
- Parent attitudes/pressure
- Girls' lack of interest
- Cultural/societal attitudes/pressures
- Media portrayal of women or lack of women in these areas
- Other_____

8. What is your position here at the conference?

- parent-chaperone
- teacher-chaperone
- school counselor-chaperone
- workshop presenter
- non-presenter industry volunteer
- guide-volunteer
- other_____

9. GESET tries to encourage girls to keep their future career options open by taking high school classes in science, math and technology. Please rate the importance of the following aspects in regard to helping this event reach this goal.

| | Not at All Important | 1 | 2 | Neutral | 3 | 4 | Very Important | 5 |
|--|----------------------|---|---|---------|---|---|----------------|---|
| a) Learning about new things | 1 | | 2 | 3 | | 4 | | 5 |
| b) Learning about new career opportunities | 1 | | 2 | 3 | | 4 | | 5 |
| c) Engaging in hands-on activities | 1 | | 2 | 3 | | 4 | | 5 |
| d) Being with friends | 1 | | 2 | 3 | | 4 | | 5 |
| e) Choosing workshops | 1 | | 2 | 3 | | 4 | | 5 |
| f) Learning what high school courses girls should take | 1 | | 2 | 3 | | 4 | | 5 |
| g) Interacting with a network of professionals in the areas of science, technology, engineering and mathematics. | 1 | | 2 | 3 | | 4 | | 5 |

10. How likely would you be to recommend participating in GESET to a friend or colleague?

| Not at All Likely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Very Likely | 10 |
|-------------------|---|---|---|---|---|---|---|---|---|-------------|----|
|-------------------|---|---|---|---|---|---|---|---|---|-------------|----|

11. After the GESET event, would you recommend a career in math or science to a girl?

| Extremely Unlikely | 1 | Unlikely | 2 | Neutral | 3 | Likely | 4 | Extremely Likely | 5 |
|--------------------|---|----------|---|---------|---|--------|---|------------------|---|
|--------------------|---|----------|---|---------|---|--------|---|------------------|---|

12. What is your gender? Female Male

13. What school or company are you affiliated with? (Optional)_____

14. If you would like to volunteer next year, please provide us with your contact information.

- Name:
- Organization:
- Email Address:
- Additional Comments

Girls Exploring Science, Engineering & Technology Event 2008 Final Report

Appendix E: Most and Least liked workshops

| <i>Sessions Most Liked</i> | | | |
|---------------------------------|----|---|----|
| All | 65 | Primitive Lifeforms | 14 |
| Heart Dissection | 42 | Weather Station | 14 |
| Separating Blood to Save Lives | 39 | Computer Game Creation | 13 |
| Forensics and Food Mystery | 34 | Nitrogen Cycle Game | 13 |
| Gumdrop Domes and Paper Bridges | 32 | Process Technology | 13 |
| Living in Space | 32 | Starlab Planetarium | 13 |
| Electronics Lab | 30 | The Most Important Issue for Your Generation: Water | 13 |
| What a Brain | 30 | Water Wise Landscapes | 12 |
| ? | 28 | Wildlife Management | 12 |
| Circuits and Logic | 28 | Climate and Sustainability | 11 |
| CBI Forensics | 27 | Hydrologic Cycle of Reservoirs | 11 |
| Solar Cars | 27 | Sounds of Vibration | 10 |
| Dive Into Athletic Training | 26 | Water Quality Tests | 10 |
| Launching Humans Into Space | 26 | Construction Engineering | 9 |
| Rocket Science 101 | 24 | Electrical and Computer Engineering Careers | 9 |
| Water Treatment | 24 | Make Your Own Aquifer | 9 |
| Build a Bot! | 23 | Which Water Workshop ? | 9 |
| Animal Crossings | 22 | Winning at Math and Science | 9 |
| Eggstraordinary Landers | 22 | Virtual Anatomy | 7 |
| Computer Pieces and Parts | 21 | Our Ever Expanding Universe | 6 |
| South Pole Experiments | 21 | Catapult Capers | 5 |
| Let's Go to Water World | 18 | Classification Keys | 5 |
| Prosthetic Devices | 18 | None | 4 |
| Structural Shakedown | 18 | Infrared Fun | 3 |
| Lego Robots | 17 | Kalimba Thumb Piano | 3 |
| The Science Behind Safe Foods | 16 | The Power of Two | 3 |
| Biomass to Biogas | 15 | Harnessing Wind Energy | 2 |

Girls Exploring Science, Engineering & Technology Event 2008 Final Report

| <i>Session Liked Least</i> | | | |
|---|-----|---------------------------------|----|
| None | 178 | Electronics Lab | 12 |
| ? | 44 | Water Wise Landscapes | 12 |
| Our Ever Expanding Universe | 36 | Biomass to Biogas | 11 |
| Electrical and Computer Engineering Careers | 34 | Computer Pieces and Parts | 11 |
| Lego Robots | 31 | Forensics and Food Mystery | 11 |
| Oil and Gas Exploration | 27 | Hydrologic Cycle of Reservoirs | 11 |
| Let's Go To Waterworld | 26 | What a Brain | 11 |
| Infrared Fun | 25 | All | 10 |
| Starlab Planetarium | 19 | Make Your Own Aquifer | 10 |
| Structural Shakedown | 19 | Primitive Lifeforms | 10 |
| The Most Important Issue of Your Generation - Water | 19 | South Pole Experiments | 10 |
| Classification Keys | 18 | Dive Into Athletic Training | 9 |
| Launching Humans Into space | 18 | Gumdrop Domes and Paper Bridges | 9 |
| Prosthetic Devices | 18 | Circuits and Logic | 8 |
| Virtual Anatomy | 18 | Heart Dissection | 8 |
| Climate and Sustainability | 17 | Water Treatment | 8 |
| Nitrogen Cycle Game | 17 | Wildlife Management | 8 |
| Separating Blood to Save Lives | 17 | Which Water Workshop ? | 7 |
| The Power of 2 | 17 | Living in Space | 6 |
| Water Quality Tests | 17 | Catapult Capers | 5 |
| Build a Bot! | 15 | Harnessing Wind Energy | 5 |
| Computer Game Creation | 15 | Solar Cars | 5 |
| CBI Forensics | 14 | Process Technology | 4 |
| Construction Engineering & Management Careers | 14 | Weather Station | 3 |
| Rocket Science 101 | 14 | Winning at Math and Science | 3 |
| The Science of Food Safety | 13 | Eggstraordinary Landers | 2 |
| Animal Crossings | 12 | Kalimba Thumb Piano | 2 |

Girls Exploring Science, Engineering & Technology Event 2008 Final Report

Most and Least liked workshops- Cross Referenced

| <i>Ranking of Workshops (After Cross-Referencing)</i> | | | |
|---|----|---|------|
| All | 55 | Which Water Workshop ? | 2 |
| Heart Dissection | 34 | Kalimba Thumb Piano | 1 |
| Living in Space | 26 | Catapult Capers | 0 |
| Forensics and Food Mystery | 23 | Hydrologic Cycle of Reservoirs | 0 |
| Gumdrop Domes and Paper Bridges | 23 | Prosthetic Devices | 0 |
| Separating Blood to Save Lives | 22 | Water Wise Landscapes | 0 |
| Solar Cars | 22 | Make Your Own Aquifer | -1 |
| Circuits and Logic | 20 | Structural Shakedown | -1 |
| Eggstraordinary Landers | 20 | Computer Game Creation | -2 |
| What a Brain | 19 | Harnessing Wind Energy | -3 |
| Electronics Lab | 18 | Nitrogen Cycle Game | -4 |
| Dive Into Athletic Training | 17 | Construction Engineering | -5 |
| Water Treatment | 16 | Climate and Sustainability | -6 |
| CBI Forensics | 13 | Starlab Planetarium | -6 |
| South Pole Experiments | 11 | The Most Important Issue for Your Generation: Water | -6 |
| Weather Station | 11 | Water Quality Tests | -7 |
| Animal Crossings | 10 | Let's Go to Water World | -8 |
| Computer Pieces and Parts | 10 | Virtual Anatomy | -11 |
| Rocket Science 101 | 10 | Classification Keys | -13 |
| Sounds of Vibration | 10 | Lego Robots | -14 |
| Process Technology | 9 | The Power of Two | -14 |
| Build a Bot! | 8 | ? | -16 |
| Launching Humans Into Space | 8 | Infrared Fun | -22 |
| Winning at Math and Science | 6 | Electrical and Computer Engineering Careers | -25 |
| Biomass to Biogas | 4 | Oil and Gas Exploration | -27 |
| Primitive Lifeforms | 4 | Our Ever Expanding Universe | -30 |
| Wildlife Management | 4 | None | -174 |
| The Science Behind Safe Foods | 3 | | |

Appendix F: *Adult Comments for Improvement*

- **5. If you were planning this event for next year, what improvements would you make?**
- Getting the girls in and registration seemed cumbersome. Presentation was going on and there were still many in the check out area.
- Snacks
- Feed the girls a snack or suggest they bring one
- Have snacks for the girls during the opening event
- Afternoon events?
- Get the girls to the workshop on time. More even numbers across the workshops
- It would be nice to know ahead of time how many have signed up for the workshop so you could prepare. Also we got a fairly late start in the first session which drastically reduced the value of the first workshop.
- Smaller class size, start on time, brief volunteer staff- didn't have surveys or pens, better sounds system
- Explain a little more clearly what the guides and volunteers tasks will be, maybe familiarize guides/volunteers with workshops prior to event
- Turn up speaker, more organization
- More activities less instruction, student selection of workshop or if selected then vary subjects like electric, bio, etc...
- Try to stick to the schedule time was off this year and we were rushed through
- Don't try and do anything after handing out lunch
- Computer set-ups could use mouse pads
- Less opening comments first workshop got late start
- Add snack break or provide snacks, girls in last session were hungry at about 11:45 50-60 min session would have been ideal letting girls choose their classes
- I would include a quick snack for the girls, lots of them kept mentioning they were hungry, it may help them focus also, let the girls pick the workshop they attend
- 45 min is short, but 70 is long, also girls may need a snack, it had been a long day by the time of the 2nd session
- None
- Plan it a different weekend than the swe conference (society of women engineers conference)
- Need simple and fun and interactive workshops, some w/s are too difficult and /or too boring. We need to have fun to get girls interested
- I recommend that (if possible) all girls at guides tables take the same sequence of workshop throughout the morning. After the first workshop this year, girls headed off in all directions, and guides were perplexed about how to gather up girls and get them to workshops
- More information for the volunteers about where to take the girls in 2nd and 3rd sessions.
- Advertise the teacher/chaperone workshops, we didn't have a clue what was going on. How many were there? Which rooms? Room #s were given during the keynote were empty.
- Very well organized
- n/a
- Get started
- Don't run behind on announcements get the girls in workshops ASAP
- Beginning table number should match school name/table at end of day. Mark the building map exactly like the signs in hallway. Example room 101 was newly in the korbelt ballroom e2f. Mark "korbelt" on the map not "sunken ballroom"
- Better sound quality in the auditorium

Girls Exploring Science, Engineering & Technology Event 2008 Final Report

- Have schools reserve certain # of spots, send descriptions w/ original registration choices!
- More time for getting the word out. Have a schedule w/names for guides
- Have a master list for teachers to be able to see where students were (maybe just a paper copy of their name tags)
- Liaison btw school and engineers
- Spend 2-3 days as an expo to help the children see more what is out there and get contacts to help guide them thru middle and high school
- Photo release form online so it's available earlier. All volunteer wear lei's or similar identifiable accessory
- More hands on activities
- Have workshops set for teachers
- Get media release form to schools earlier

- Review the workshop material prior to the event. The workshop I was in was way over the girls heads. I thought it seemed like introductory college material. During the 2nd workshop the instructor admitted it was developed for 12th graders. If kids are presented with material that is that far above their level they will think science and math is way too difficult and will choose to avoid it
- Duty of guides not clear. Not all guides stayed with first workshop. It wasn't emphasized at the briefing
- Needed more time
- Start on time in the beginning of the morning
- More organization, the volunteers need more information
- Send roles, responsibilities and requirements in email ahead of time. Improve ball room sound system
- Better sound system, couldn't hear esp. closing statements. More thorough orientation, or cleared. Anticipate possible volunteer and exhibitor questions address in orientation and more enthusiasm. Include bio-tech, veterinary science have people explain what ----- job does (maybe don't in workshops. many of the suggested questions seemed a bit advanced/deep/ and even burdensome for this age group. Lockheed's obama comments were unnecessary and biased. no evaluations in our workshop, some girls didn't get them
- None
- Have a much better sound system so people in the back can hear. (speakers needed in back we heard nothing)
- Start 1st workshop on time, keep comments short before
- Less students per class
- Stay on time

- 1, a lot of speeches at the end... do before workshops, 2 test the sound equipment to be heard over loud noises, 3 have girls all come up to the stage for door prizes: couldn't hear 4 more clarity on responsibility for guides
- I think there were too many girls, making it a little more difficult
- Make it clearer which workshops guides attend/help with
- There should more organization for the guides to take kids from workshop to workshop