

Energizing Potential

AAUW Long Beach STEM Career Conference for Girls
Conference Effectiveness Evaluation 2021



AAUW

empowering women since 1881

Energizing Potential:

The Effectiveness of the AAUW Long Beach STEM Career Conference on LBUSD Middle School Girls



2021



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FOREWORD

The American Association of University Women (AAUW) Long Beach STEM Career Conference was envisioned by its originators in 2003 as an opportunity for middle-school girls from economically challenged households to be inspired to consider careers in STEM (Science, Technology, Engineering and Math) and to further their education. The Conference is an abbreviated version of the one-week AAUW California Tech Trek camp program held on college campuses. It is conducted at Long Beach City College (LBCC) on a Friday afternoon and provides two hands-on career workshops and an inspiring keynote speaker.

Over the lifetime of the Conference, the greatest challenges have been enrolling the girls to attend and covering the event costs. This is a demographic for whom arranged transportation and encouragement from trusted adults is absolutely necessary to ensure attendance. We partnered first with nonprofit afterschool organizations, and an occasional teacher with field trip funding. Now successfully partnering with Champion teachers and counselors at select Title I financed Long Beach Unified School District (LBUSD) middle schools, we still have moments where we are asked to share the efficacy of the program to recruit new Champions and to persuade parents/guardians reluctant to include their daughters in the event.

It was the second challenge – covering the increasing event costs - that finally nudged us in the direction of formally evaluating the efficacy of the STEM Career Conference. The recession that began in 2008 jolted our nonprofit partners. No longer did the nonprofits have the resources to enroll and transport their charges. The LBCC facilities were no longer gratis. The College needed to charge fees, and as we expanded the attendance, those fees increased accordingly. A local nonprofit which had sent their girls to the Conference in the past and had a similar mission, needed to close its doors and the STEM Career Conference was the fortunate beneficiary of its remaining funds. However, those were only going to cover five years' worth of expenses, so fundraising through grants and sponsors became mandatory.

Around 2012, corporate sponsorship of girls' involvement in STEM was awakening. However, corporate interest in funding specific issues can wane, as can their ability to give. To have a competitive edge in fundraising requires being able to demonstrate positive outcomes based on valid research. While the excellent AAUW CA *Inspiring the Spark* evaluation of the Tech Trek program existed, there was no research available that spoke to the efficacy of a half-day STEM career program. Therefore, our branch embarked upon the *Energizing Potential* evaluation process in 2014, with the understanding that it would be four years before a survey could be administered to high school seniors who had attended the Conference as eighth graders.

We strongly believed that the STEM Career Conference was making a difference in the lives of these young women – anecdotally we could state it. We saw it in the enthusiasm of the attendees in the workshops, the buzz in the room in the concluding sessions, the glowing thank-you notes and evaluations filled out by the girls at the end of the evening. But now we have proof, through outcomes based on valid research, that the event is making a lasting and positive difference in their lives. It is our pleasure to share these results with you.

Mary Lamo, Frances Rozner and Raquel Sanchez
AAUW Long Beach STEM Career Conference Research Co-Chairs

EXECUTIVE SUMMARY

The AAUW Long Beach STEM Career Conference for middle school girls promotes girls' interest and success in science, technology, engineering, and math (STEM) fields. The program's goals are to encourage traditionally underserved students to select STEM courses in high school, motivate girls to pursue a college education, and inspire them to enter STEM careers. To learn how the Conference program influenced participants, AAUW Long Beach chose to survey eighth-grade girls who had attended in 2015 and 2016. AAUW Long Beach contracted with the Long Beach Unified School District (LBUSD) Research Department to supply data over six years of the project. It also commissioned MissionQuest, Inc. to create, manage and analyze the responses to an online survey similar to that used in the 2013 AAUW California's Tech Trek *Igniting the Spark* research. The survey asked Conference alumnae, in their senior year of high school (2019 and 2020), about their subsequent academic pathways, attitudes toward STEM, and perceived impact of their conference experience.

Survey results indicate that the majority of the 44 respondents elected to take more science and advanced math classes in high school after attending the Conference. STEM Career Conference participants from 2015 and 2016 markedly outpaced their non-participant peers in completion of AP courses in high school. Fully half of survey respondents reported the STEM Career Conference resulted in them changing their high school math and/or science pathway choice. All of the survey respondents graduated from high school and plan to attend college. Eighty percent (131 of 163) of the 2015 and 2016 cohorts' seniors (those giving permission to have their courses tracked), enrolled in college. Nationally, in 2019, 66.2 percent of high school graduates enrolled in college. Close to half of the survey respondents intend to major in STEM fields.

Survey alumnae described the Conference's enduring impact on their self-confidence, identity, and attitude toward STEM. The event boosted their self-confidence to do well in science and math classes and normalized this pathway as a valid choice for them. Through exposure to real-world scientific phenomena, and female role models, participants credited the Conference with introducing them to a variety of STEM careers and opportunities about which they were previously unaware. There was clear preference for hands-on activities by 99 percent of respondents, of whom 52 percent rated this aspect as "Most Important." Similarly impactful was meeting women at the Conference, who have jobs in STEM-related careers. Eighty-six percent of survey respondents reported the STEM Career Conference boosted their self-confidence in their ability to succeed in their science classes; 86 percent feel their experience gave them greater confidence in their ability to do well in school overall, and 75 percent reported the conference boosted their self-confidence in their math classes.

Respondents cite the positive social-acceptance effect of being at the Conference with like-minded peers who shared an interest in STEM, particularly at the self-conscious stage of adolescence. Eighty-six percent found this to be impactful. In their high school STEM courses taken after attending the Conference, many indicated an increasing number of female classmates; however, female teachers in STEM are still in short supply, with very few teaching

the advanced, honors or Advanced Placement (AP) courses. Responses indicate that the Conference's Keynote Speaker addresses, emphasizing overcoming obstacles and the power of women, and usually delivered by young women of color, are especially confidence-building for those attendees raised in households with limited expectations of a woman's role in society.

The AAUW LB STEM Career Conference is achieving its goals of encouraging traditionally underserved students to select STEM courses in high school, motivating girls to pursue a college education, and inspiring them to enter STEM careers. Conference alumnae are taking away from the experience a plethora of insights, experiences, and values that are positively impacting their lives.

INTRODUCTION

The AAUW Long Beach STEM (Science, Technology, Engineering and Math) Career Conference exposes seventh and eighth-grade girls to careers in STEM fields and to women working in those fields. The first Conference, held on a Saturday morning in 2003, was attended by 45 middle-school girls. With an annual goal of 250 girls attending, the 2020 Conference attendance reached 251. Through February 2020, 2693 girls had attended the AAUW LB STEM Career Conference. Over 60 volunteers are involved each year.

The goals of the Conference are:

1. Encourage an underserved group of young women to take math and science courses throughout high school
2. Motivate students to attend college
3. Inspire young women to consider careers in STEM

MissionQuest, Inc. was engaged in 2018 to create the survey, to manage the online responses in 2019 and 2020 and, in 2021, to analyze the survey responses.

The survey used to evaluate the effectiveness of the Conference was written with the cited-above goals in mind and follows some overall lines of inquiry:

1. Are girls continuing STEM studies through high school, applying to college, and selecting STEM majors?
2. What other STEM-related activities are girls involved in outside of academics?
3. What course choices are girls making in high school?
4. To what extent are girls encountering women in the roles of fellow students and teachers in their STEM courses?
5. To what careers do they aspire?
6. What impact did the Conference have on girls' self-confidence, identity, and attitude toward STEM?
7. What was most important to attendees about their Conference experience?

Details about the Conference:

The girls are bused in from their Long Beach Unified School District (LBUSD) middle schools, all of which are substantially Title I funded, for a late afternoon program at the Liberal Arts Campus of Long Beach City College. Since 2010, the event has been held the last Friday in February, 4:30pm to 7:00pm.

The girls each receive a conference goodie bag and a bag of healthy snacks upon arrival. A dynamic keynote speaker – young and usually of color - starts the conference with a message about overcoming obstacles and achieving success. Then each girl attends two 45-minute workshops, with hands-on activities, presented by women in STEM careers, who excite them about the possibilities of such careers and encourage them to attend college. Ten different careers are offered, with the girls choosing three when they register. The promise is that they

will receive one of their choices. Appendix A lists the careers available to the girls involved with *Energizing Potential* who attended in 2015 and 2016.

The girls are registered through LBUSD middle schools and attend as members of closely supervised groups. Each involved school has a designated Conference Champion, often a teacher, but sometimes a counselor. Each school, because of busing issues, has a limited number of registrants. Champions vary on how they determine who attends: some girls are specifically asked based on their current interest in STEM, others because they show potential and need encouragement. In most cases, the opportunity to attend is open to all girls at the school who meet the registration deadline.

The timing of the Conference, in late February, precedes the eighth graders' selection of their ninth-grade high school courses. However, eighth graders are required to designate their high school pathway by December of their eighth-grade year. Pathways could be in computer science, medicine, justice, the arts, etc. Only certain high schools offer specific pathways. The pathway decision determines the high school they will be attending. Once at a high school, a student may change to a different pathway offered at that high school but cannot transfer to another high school (LBUSD has 14 high schools). Therefore, some of the Champions will favor registering more seventh graders than eighth graders for the Conference.

In the concluding Conference session, ten girls, each a representative of a career, share with the assemblage what they have learned/created in the workshop. Each attendee then fills out and submits an event evaluation form and writes a thank-you note to someone who has positively influenced them that day. A second snack bag is distributed prior to boarding the bus to return to their schools.

METHODOLOGY

In 2014, the AAUW Long Branch obtained permission from the AAUW STEM Task Force to mirror the methodology developed for the 2013 Tech Trek evaluation, *Igniting the Spark*.

In January 2015, the AAUW Long Beach branch entered into a contract with the Long Beach Unified School District's Research Department to conduct a research project into the efficacy of the STEM Career Conference to which LBUSD teachers and counselors were devoting countless hours to involve LBUSD students. The Research Department supplied the following:

- 1) The high school STEM classes taken by the girls whose permission was received to be tracked.
- 2) The aggregated high school STEM classes taken by all the eighth-grade girls who attended the Conference.
- 3) The aggregated high school STEM classes taken by all the eighth-grade girls from the participating middle schools who did not attend the Conference
- 4) The high school pathways chosen by the girls agreeing to be tracked.
- 5) The National Student Clearinghouse data on college attendance in the Fall following their high school graduation

A survey conducted in the conference-attending students' senior year of high school was determined to be the best mode of evaluation. First, however, the students and their parents/guardians needed to give written permission for the District to provide the course work of the students over a four-year period and for the AAUW LB branch to contact the girls in the spring of their Senior year. The permission forms, created in both English and Spanish, were filled out by all eighth-grade students attending the 2015 and 2016 conferences. All those agreeing to have their courses tracked became known as Cohort 2015 and Cohort 2016. Those also giving permission to be surveyed were a subset of the cohorts. This subset would be contacted for the survey in 2019 and 2020.

The 2015/2019 and 2016/2020 participation:

	2015/2019 Cohort	2016/2020 Cohort
Attended Conference (aggregate)	128	116
Permission Granted to Track	96	109
Permission Granted to Survey	63	97
Available to Survey 4 years later	49	70
Completed Survey	20 (41%)	24 (34%)

When it came time to survey the girls, the plan was to contact the parents/guardians by email via the District's School Messenger program, asking them to share the link to Survey Monkey with their daughters. In May 2019, after only one response, Plan B went into effect: phoning the girls, using four-year-old numbers, splitting the call list into English and Spanish based on the School Messenger preference. Also created were customized letters to the girls, delivered

via their school counselors at 10 high schools. In April 2020, with the schools in pandemic lockdown, phone calling was the primary form of contact. The total response was 37%, which compared favorably to the 35% completed survey response of the *Igniting the Spark* evaluation.

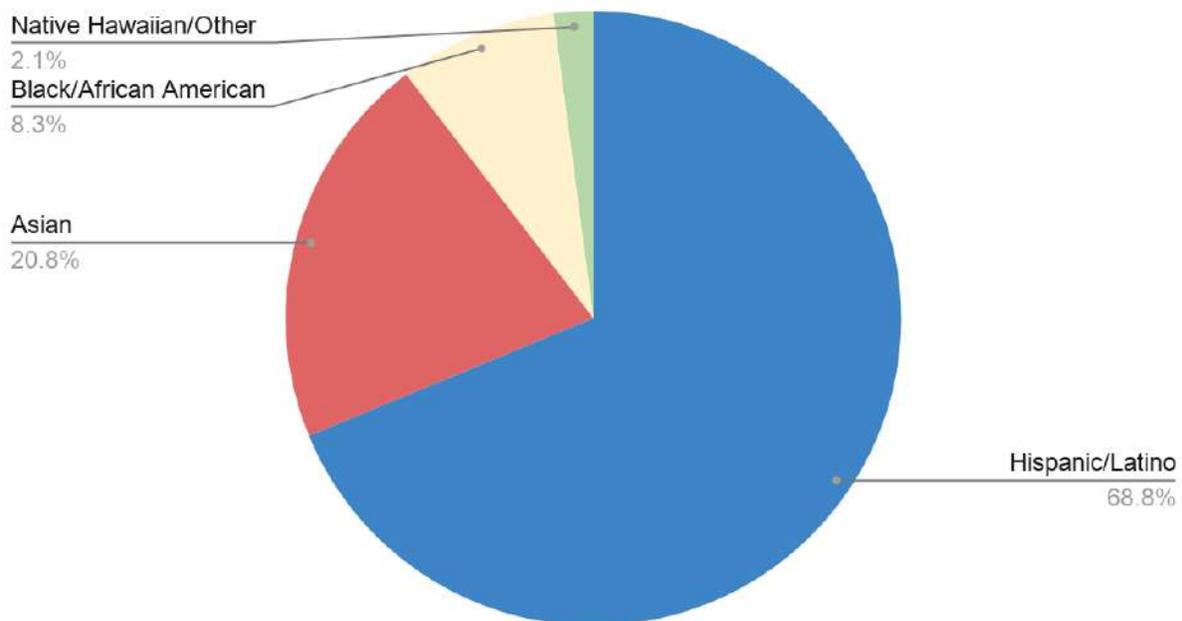
The survey findings report makes extensive use of individual quotations from answers to open-ended response questions. Each survey question number is represented with the letter Q and the number of the question on the survey (e.g., Q1). The same questions were used for both the 2019 and 2020 surveys. See Appendix C for the survey taken in 2020 by the 2016 Cohort.

SURVEY DEMOGRAPHICS

The survey's target population consists of Long Beach Unified School District (LBUSD) girls who attended the AAUW LB Science, Technology, Engineering & Mathematics (STEM) Career Conference as eighth graders during February of 2015 or 2016. At the time the surveys were completed for the 2015 cohort (May 2019) and the 2016 cohort (April 2020), all respondents were seniors in high school.

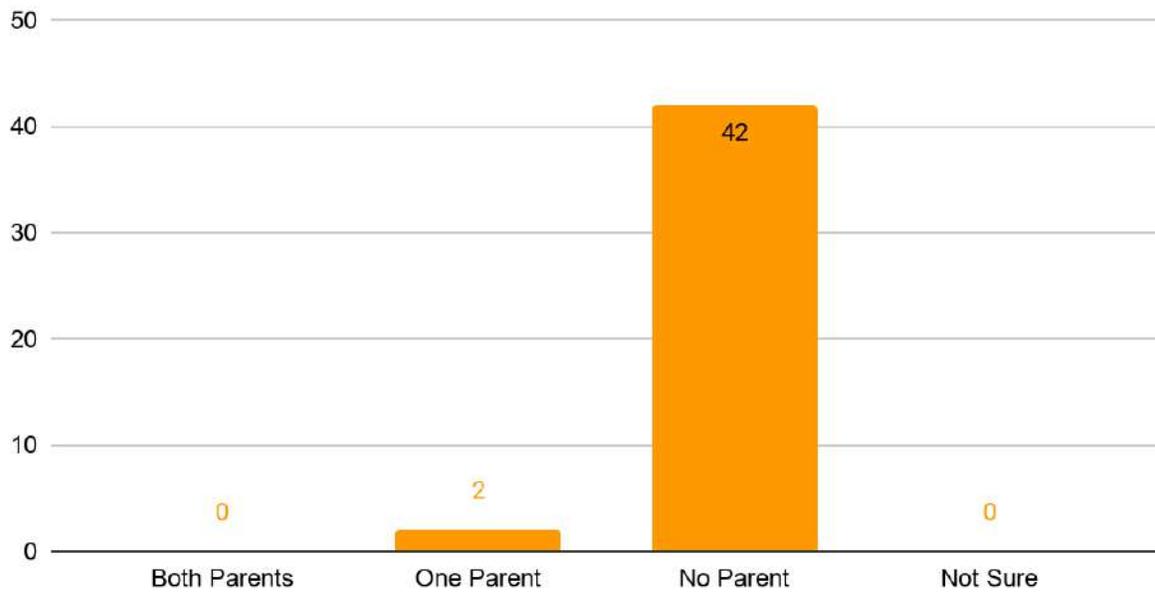
Over two-thirds (69%) of survey respondents identify themselves ethnically as Hispanic/Latino, 21 percent identify as Asian, 8 percent Black/African American, and 2 percent Native Hawaiian/Other Pacific Islander. No respondents identified as Alaskan Native, Native American, Middle Eastern, Other, or White.

Figure 1. Student Race/Ethnicity (Q3)



When asked if any parent worked in STEM fields while the student attended the AAUW LB STEM Career Conference, nearly all participants declared that no parent worked in STEM-related fields (95 percent). Of the other 5 percent of respondents, the remaining alumnae reported that one parent worked in STEM. None of the respondents had both parents working in a STEM field at the time they attended the AAUW LB STEM Career Conference.

Figure 2. At the time that you attended the STEM Career Conference, did one or both parents or guardians work in a STEM-related job? (Q4)



SURVEY FINDINGS

1. Are girls continuing STEM studies through high school, going to college, and selecting STEM majors?

All (100 percent of 44 respondents) of AAUW LB STEM Career Conference alumnae from February of 2015 and 2016 indicate they are on track to graduate from high school on time. All (100 percent of 44 respondents) plan to attend college. In terms of college plan, over two-thirds (70 percent) intend to attend a 4-year college directly, 25 percent intend to transition to a 4-year college after starting at a 2-year college, and 5 percent are planning to attend a two-year college.

LBUSD provided AAUW LB, using National Student Clearinghouse data, with the names of the colleges and universities which the 2015 and 2016 tracked alumnae were attending in the Fall after their high school graduation. Eighty percent (131 of 163) of the 2015 and 2016 cohorts' seniors (tracked alumnae), enrolled in college. According to the U.S. Dept of Education's National Center for Education Statistics, for 2019 high school graduates,¹ the rates achieved by conference alumnae are higher than the national average for high school graduates (66.2 percent of 2019 high school graduates enrolled in college).

Nationally, 44.4 percent of high school graduates enter a four-year institution and 21.8 percent enter a two-year college¹. Of the 163 2015 and 2016 cohorts' seniors (all of whom graduated high school), 48 percent enrolled in a four-year college and 32 percent enrolled in a two-year college. STEM Career Conference attendees from 2015 and 2016 are attending four-year colleges directly at a higher rate than most American graduates who enter a postsecondary institution. The high 32 percent entering a two-year college includes 46 women attending Long Beach City College. This may be due to the Long Beach Promise, a collaboration between LBUSD, Long Beach City College and California State University Long Beach. Based upon academic performance, LBUSD graduating seniors are eligible to receive two years of free tuition at Long Beach City College followed by a guaranteed transfer to California State University at Long Beach, a four-year college. Considering the demographics of the STEM Career Conference attendees, this transition option could be a practical decision for those interested in attending a four-year college close to home.

The most frequently attended institutions (with at least 10 alumnae attending, but more often over 45 alumnae) included California State University (Chico, Dominguez Hills, East Bay, Fullerton, Long Beach, Los Angeles, Northridge, Pomona, San Jose, Sonoma), Long Beach City College, and University of California (Irvine, Los Angeles, Merced, Riverside, Santa Barbara, Santa Cruz). A significant portion of alumnae (89 percent) were enrolled at the various campus locations of these three publicly supported institutions (California State University, Long Beach Community College, and University of California). See Appendix B for a complete list of the postsecondary institutions being attended by 2015 and 2016 conference alumnae.

2. What other STEM-related activities are they involved in outside of academics?

About 20 percent of respondents report they have participated in afterschool or non-school STEM activities during their high school years. Activities selected for participation from attendees included STEM-focused clubs and competitions (VEX Robotics, MESA, First Robotics Competition). Other girls participated in hospital-based healthcare programs. Some elected to take STEM classes at community colleges. Finally, some students attended STEM conferences. A full list of extracurricular activities identified by attendees were as follows:

- Hospital-based healthcare program
- VEX Robotics
- Mathematics, Engineering, Science, Achievement (MESA)
- First Robotics Competition (FRC)
- STEM conferences
- Community college classes
- Long Beach Public Library Build a Catapult program

3. What was the impact of the AAUW LB STEM Career Conference on attendees?

Question 5 of the alumnae survey asked respondents to put into their own words a full sense of what effect the STEM Career Conference had on them. Respondents' answers can be categorized in a number of ways, though for this evaluation, key themes have been extracted from responses and categorized as follows: career/education effects, social effects, knowledge effects, and confidence in gender effects. Attendees see the STEM Career Conference as a catalyst for energizing and sustaining their interest in STEM, but the impact on many attendees is much further reaching.

CAREER/EDUCATION EFFECTS OF The STEM Career Conference

Student responses to open-ended questions about the impact of the STEM Career Conference were replete with citations of their experience as a catalyst to refining, directing, or supporting their career choice or educational field. Below are some of the responses (or portions of responses) where alumnae described how the STEM Career Conference impacted the direction of their career and coursework selections:

The Conference helped me decide what I want to study in college; throughout my years in high school I was fascinated with Marine Biology but going into senior year I then realized that I wanted to help people and the environment as well. Which is why I chose to major in social science/humanities but keep Marine Biology as a second major or hobby.

The STEM Career Conference affected me because it inspired me to pursue computer science and engineering along with going to the recognized engineering college, Cal Poly San Luis Obispo.

It really impacted me in choosing my major for college which is Biology. It made me see how much I truly liked science and that I wanted to pursue a STEM based career.

I was exposed to a wide array of STEM careers that I previously knew nothing about. It also encouraged me to explore options for a career in STEM.

It was really interesting to learn about different careers and it made me want to learn more.

I was back and forth about majoring in a STEM (subject) because I knew not a lot of women choose to major in those aspects but the conference made me realize there were many girls of my age that were interested in majoring in STEM and it really influenced me to choose a STEM major.

The STEM Career Conference made me want to do more research on the career and invest my time more into this and take it as an opportunity of learning about a career path that can change the world and also expand your mind.

The STEM Career Conference allowed me to explore different majors that were involved in the STEM field. It increased my knowledge as well as gave me motivation to be in a STEM major.

The STEM conference was really exciting and seeing all the girls there gave me motivation to continue learning about STEM and careers involving STEM. It was an opportunity that allowed growth in all the girls attending including myself.

SOCIAL EFFECTS OF The STEM Career Conference

Student responses to open-ended questions about the impact of the STEM Career Conference included impacts on them that extended far beyond the specific topics and moved into the sense of camaraderie and other social impacts developed by their attendance. Below are responses - or portions of responses - that identify how alumnae believe the career conference had a social impact on them.

The effect that the STEM career conference had on me was more group communication.

It made me more social with other people and helped me to work better in groups.

The STEM conference helped me meet new people.

I attended the STEM conference in middle school and it was a memorable experience. I was able to participate in different workshops and meet many people at the event which I am still currently in contact with.

The STEM Career Conference affected me greatly because it gave me the courage to be social around others.

KNOWLEDGE EFFECTS OF The STEM Career Conference

Student responses to open-ended questions about the impact of the STEM Career Conference were full of notations regarding how much knowledge the conference instilled in them. Below are the responses - or portions of responses - that fit in the category of a knowledge-related impact.

It made me realize how much math and science impact our world today. It made me realize that science, math, and engineering is crucial to our world.

I enjoyed the STEM Career Conference because I was able to learn more about what STEM is and met many women who were passionate about their STEM related careers that piqued an interest for me. I remember some of the workshops I participated in and loved the hands-on activities.

It gave me more knowledge towards the STEM careers and it allowed me to gain a better understanding that STEM related majors are important.

The effect that the STEM career conference had on me was more knowledge about STEM.

I was able to fully understand the careers and how if you are working it doesn't mean you can't have fun doing it.

The STEM Career Conference affected me greatly because it provided me with information that I didn't know before going.

CONFIDENCE IN GENDER EFFECTS OF The STEM Career Conference

Students responding to open-ended questions about the impact of the STEM Career Conference included many references to a major macro theme of the conference - that it is attended with females, conducted by females, and empowering females. Below are full or partial responses that reflect how attendees were impacted to feel more confident in being of female gender in the field of STEM.

The STEM Career Conference gave me the opportunity to explore different options and careers in the STEM field and to show that girls can also do the same things as boys can.

The STEM Career Conference helped me realize that women too could go into engineering and jobs that men had majority of.

I enjoyed the STEM Career Conference because I met many women who were passionate about their STEM related careers that piqued an interest for me. I remember some of the workshops I participated in and loved the hands-on activities.

4. What course choices are girls making in high school and college?

As the following table illustrates, a majority of alumnae believe the STEM Career Conference increased their interest in science (84 percent) and technology (65 percent). Close to half believe it increased their interest in mathematics (48 percent) and engineering (46 percent).

Figure 3. The STEM Career Conference increased my interest in (Q1)

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Science	0.0% (0)	4.6% (2)	11.4% (5)	43.2% (19)	40.9% (18)
Technology	0.0% (0)	7.0% (3)	28.0% (12)	48.8% (21)	16.3% (7)
Engineering	2.3% (1)	18.2% (8)	34.1% (15)	36.4% (16)	9.1% (4)
Mathematics	0.0% (0)	22.7% (10)	29.6% (13)	22.7% (10)	25.0% (11)

Furthermore, 86 percent of attendees report the STEM Career Conference boosted their self-confidence in their ability to succeed in their science classes, 86 percent feel their experience gave them greater confidence in their ability to do well in school overall, and 75 percent reported the conference boosted their self-confidence in their math classes.

Figure 4. The STEM Career Conference gave me greater confidence in my ability to be successful in (Q2)

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Math Classes	0.0% (0)	11.4% (5)	13.6% (6)	50.0% (22)	25.0% (11)
Science Classes	0.0% (0)	2.3% (1)	11.4% (5)	52.3% (23)	34.1% (15)
My ability to do well in school overall	0.0% (0)	2.3% (1)	11.4% (5)	50.0% (22)	36.4% (16)

Most surveyed students also credit their attendance at the STEM Career Conference with leading them to take more advanced math classes in high school (82 percent) and take more science classes in high school (91 percent). The impact of the STEM Career Conference on this confidence is well-described by one alumna as follows:

The STEM Career Conference showed me how many STEM related careers are available and how more women should be interested in these potential majors and careers. The conference gave me confidence for the future because even though science and mathematics were and still are my strongest subjects in school, I felt insecure because STEM related careers were seen as "lame" or "for nerds." I didn't know what I could do in college or as a career within STEM fields but seeing all of the options I can choose at the conference gave me a sense of security.

The STEM Career Conference is achieving core goals of not only introducing girls to STEM at a young age, but normalizing this pathway as a valid choice for them.

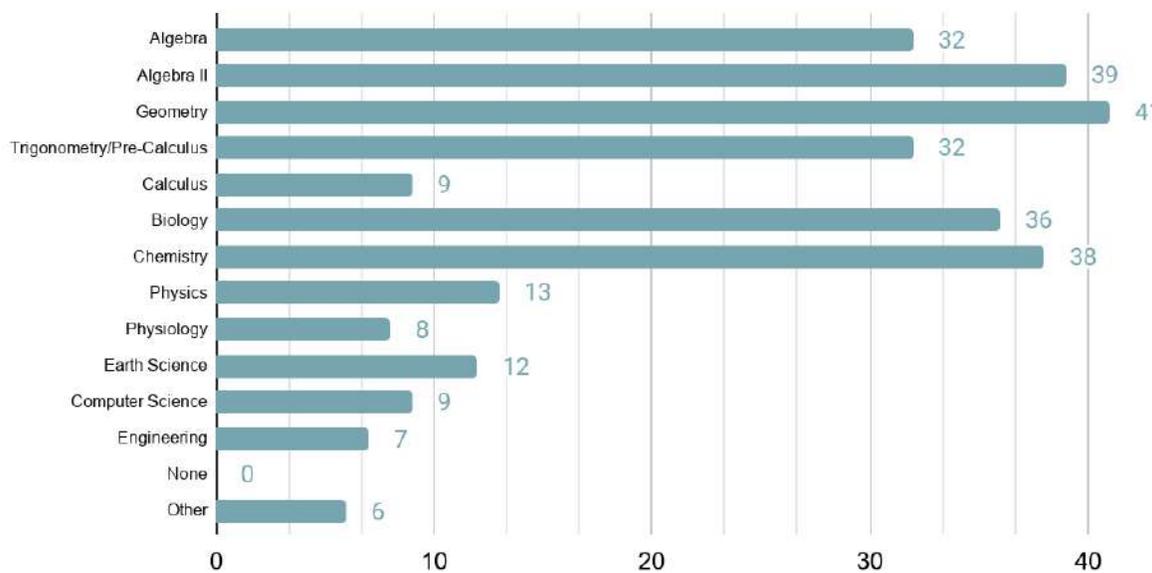
Figure 5. Because of my attendance at the STEM Career Conference, I did the following (Q3)

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Took more advanced math classes in high school	0.0% (0)	6.8% (3)	11.4% (5)	54.6% (24)	27.3% (12)
Took more science classes in high school	0.0% (0)	2.3% (1)	6.8% (3)	50.0% (22)	40.9% (18)
Took more computer science classes in high school	2.3% (1)	43.2% (19)	22.7% (10)	25.0% (11)	6.8% (3)

Even more significant, a full half of participants (50 percent) reported the STEM Career Conference resulted in them changing their high school math and/or science pathway choice.

Attendees of the STEM Career Conference are empowered to attend math and science classes. Of 44 survey responses, nearly all took geometry, algebra II, chemistry, and biology. Many attendees took algebra and trigonometry/pre-calculus. A variety of other math and science classes were selected by attendees as well. Below is a figure illustrating the number of surveyed alumnae who took each of the listed courses:

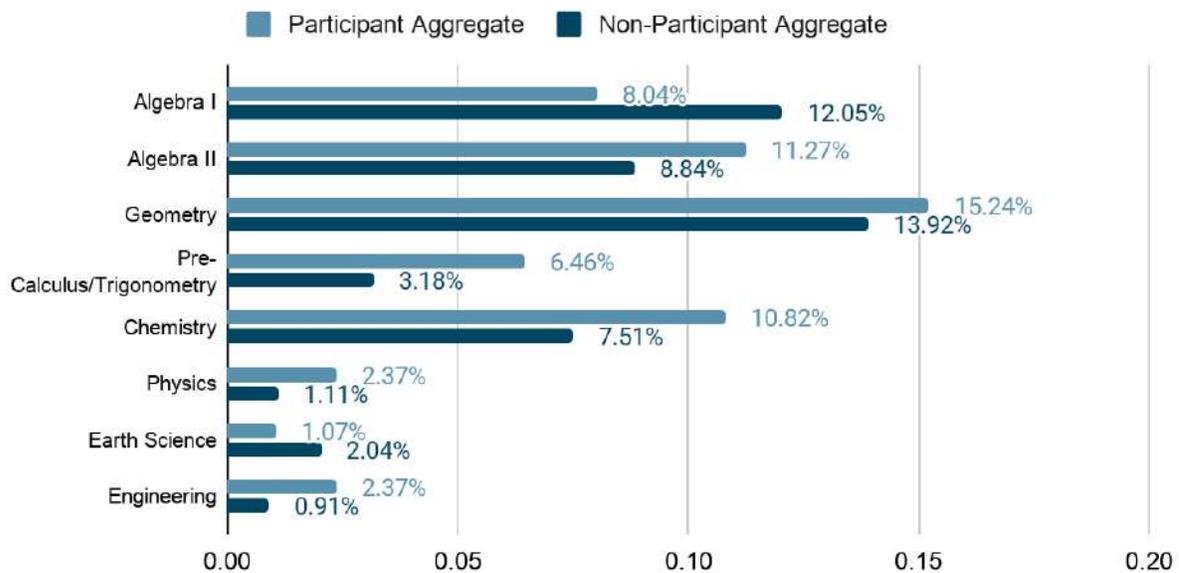
Figure 6. Which of the following non-AP mathematics or science classes did you successfully complete and/or expect to complete by the end of your senior year of high school? (Q8)



Of the surveyed alumnae who responded they took an “other” non-AP mathematics or science course, listed courses included: Chemistry HL (Higher Level), Anatomy (more than one attendee), Marine Biology, Physical Oceanography, Physiology, Medical Terminology, Human Body Systems/Anatomy, Medical Interventions, Biomedical Innovations, and FST (Functions, Stats, Trigonometry).

AAUW LB collected data on all participants attending the 2015 and 2016 STEM Career Conferences, regardless of their participation in the survey. AAUW LB also collected non-participant data for the classmates of those same eighth grade students in each year 2015 and 2016 as a comparison. Aggregate samples of the participants and non-participants were analyzed for further comparison of non-AP mathematics and science coursework completion. Some of the same choices presented in the above chart for surveyed participants (Figure 6) were not available in the aggregate participants comparison data set or the aggregate non-participant comparison data set. Whenever the same non-AP class was available, this was used for the following chart :

Figure 7. Non-AP mathematics and science classes taken by 2015 and 2016 aggregate samples for comparison

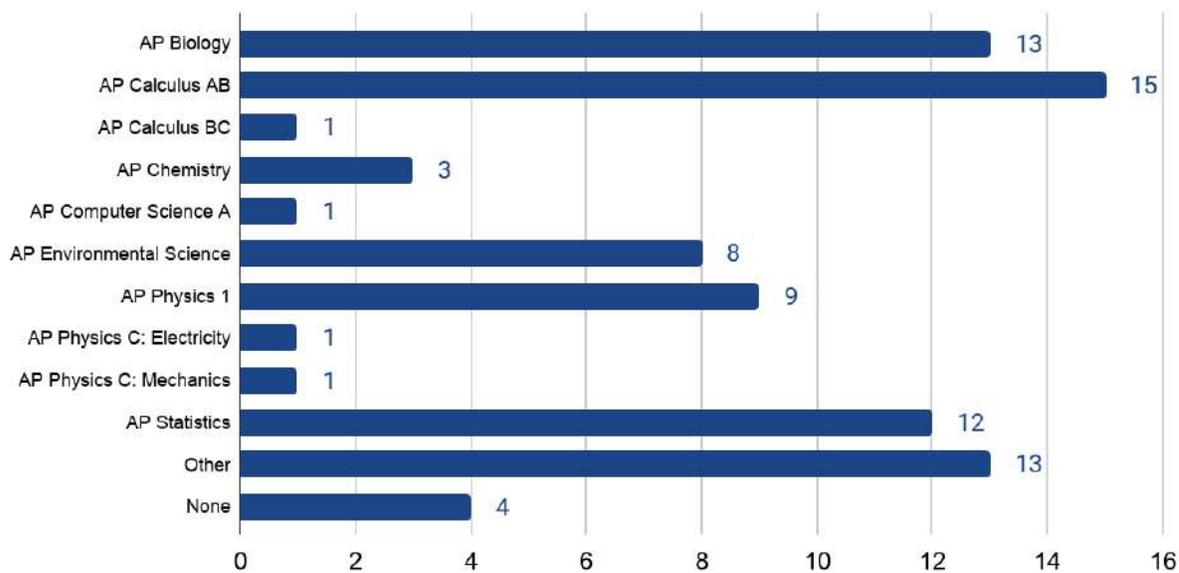


There are some clear trends in the above figure. A higher percentage of participants in the STEM Career Conference took Algebra II, Geometry, Pre-Calculus/Trigonometry, Chemistry, Physics, and Engineering classes than same-year classmates who did not participate in the STEM Career Conference. While a lower percentage of STEM Career Conference participants than non-participants took Algebra I coursework, it can be assumed from the data that this is due to the fact these students (conference participants) were taking more advanced coursework (i.e. Algebra II) instead. Keeping in mind the totality of the data presented, the only class in which non-participants outpaced STEM Career Conference participants was Earth Science.

Conclusions that can be drawn from this information is that the STEM Career Conference almost unequivocally drew participants to increase their consumption of math and science-related coursework over that of non-participant peers. This is an impressive outcome of STEM Career Conference attendance, to so clearly energize an interest in attendees for STEM coursework.

Not only were traditional math and science courses abundant in the transcripts of alumnae, but attendees challenged themselves in high school with a variety of Advanced Placement (AP) mathematics and science courses as well. The following figure shows the multitude of ways conference attendees followed up their STEM exposure with challenging AP STEM-related courses in high school:

Figure 8. Which of the following College Board AP mathematics and science courses did you take in high school and/or expect to complete by the end of your senior year of high school? (Q9)



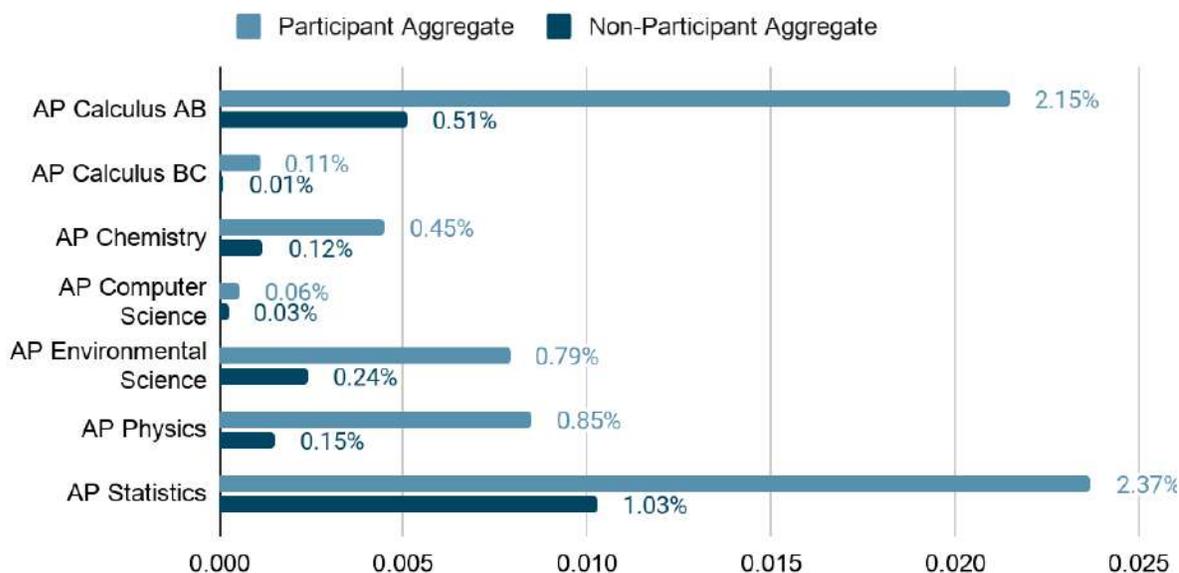
Of the survey respondents who marked the “Other” category, AP courses taken included: IB Mathematics, IB Math Studies, IB HL (Higher Level) Chemistry 1, IB HL Chemistry 2, AP Computer Science Principles, and AP Psychology. It is unclear where the AP Psychology course was attended, as this was a response written in by an alumna but the course is not offered through LBUSD. IB stands for International Baccalaureate which is a program offered only at Jordan High school. The program focuses on critical thinking and problem-solving skills which encourage diversity, international mindedness and curiosity. The IB courses are internationally-based and provide a more integrated approach to learning. IB courses are similar to AP in that the courses are college preparatory in nature and, therefore, are included here.

Counting all the AP courses listed in the survey and those included by respondents in the “other” category, AP courses most favored by attendees were: AP Calculus AB, AP Biology, and AP Statistics, with each taken by around one-third of attendees. When interpreting these results, it is important to keep in mind that not all high schools offer AP classes, and not all AP classes offered or listed above are available at all high schools. With this in mind, the figure above and responses in this category do not represent the full ambitions of STEM Conference alumnae regarding challenging STEM-related AP courses, but do provide some insight into the array of ways attendees continue to enrich their STEM experiences with additional coursework in high school years beyond their attendance.

As done with the non-AP coursework in Figure 7, the AAUW LB-collected aggregate data sets on all 2015 and 2016 STEM Career Conference participants and non-participants were analyzed for further comparison of AP mathematics and science coursework completion as well. Some of

the same choices presented in the above chart (Figure 8) were not available in the aggregate participants comparison data set or the aggregate non-participant comparison data set. Whenever the same AP class was available, this was used for the chart below:

Figure 9. AP mathematics and science classes taken by 2015 and 2016 aggregate samples for comparison



The trends presented in the table above are clear and consistent - 2015 and 2016 STEM Career Conference participants markedly outpaced their non-participant peers in completion of AP courses in high school. This was abundantly clear in all STEM-related AP courses, with the closest margin being double the percentage of STEM Career Conference participants versus non-participants who took AP Computer Science. In all other STEM-related AP courses, conference alumnae far exceeded double the rate of completion compared to their non-participant peers.

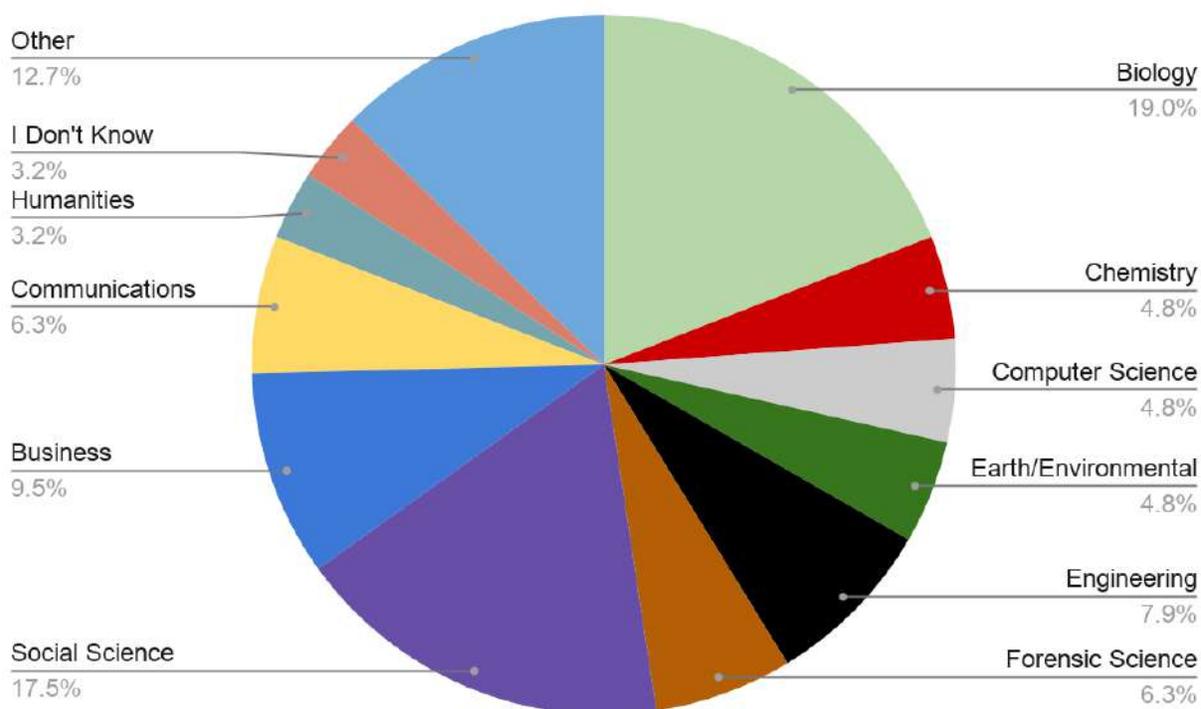
As concluded in the non-AP coursework comparison done for participants and non-participants, the STEM Career Conference is clearly drawing participants to increase their consumption of challenging math and science-related coursework over that of non-participant peers. This is an admirable achievement for the AAUW LB STEM Career Conference, to so clearly energize an interest in attendees for advanced STEM coursework. And further, this suggests not only interest, but advanced STEM coursework completion in high school is likely a precursor to advancement of STEM-related coursework completion at a college level and an increased likelihood of STEM-related career choices.

The STEM Career Conference is directly driving many attendees toward more challenging coursework selections. One alumna explained:

[The STEM Career Conference] allowed me to be aware of the different STEM careers that are often dominated by men and allowed me to meet women who were successful at pursuing a STEM career. It was a welcoming environment and it was a comfortable place to talk and ask questions. In high school, I ended up taking 2 AP Computer Science classes and AP Biology. I remember being engaged and my friends and I who went ended up enjoying the experience.

Taking STEM interest out even one step further is to evaluate how many of the middle school STEM conference attendees continue on to pursue STEM-related subjects as their college major after high school. A list of majors or major categories (e.g. Humanities) was provided to survey respondents to select their anticipated college major. An “other” category allowed written responses for those majors not covered in the list of choices. As seen in the chart below, many STEM Conference alumnae intend to continue their STEM interest in college (and beyond):

Figure 10. What is your anticipated college major? (Q16)



The category marked Social Science listed Psychology, Sociology, and Anthropology for survey respondents and the category of Humanities included Art, English, Music, and Theater Arts. For students selecting the Other category, they were asked to name what major they were pursuing. Choices identified by participants included Nursing (five respondents), Marine Biology, Animal Science, and Photography. As can be gathered from these results, many alumnae are continuing to pursue STEM studies in college.

STEM Career Conference alumnae indicate their attendance in middle school directly impacted their desire for furthering STEM-related studies at the high school level and all the way through deciding to major in STEM at the college level:

The STEM Career Conference allowed me to further on my interest in taking more science classes in high school. Therefore, it led me to choosing my major as biology for college and a high possibility of excelling in a STEM career.

The STEM Career Conference influenced me to choose the major that I'm going to do in college which is electrical engineering.

The STEM Conference had a real positive impact on my life because it had led me to decide to major in Chemistry and hope to go to Medical school.

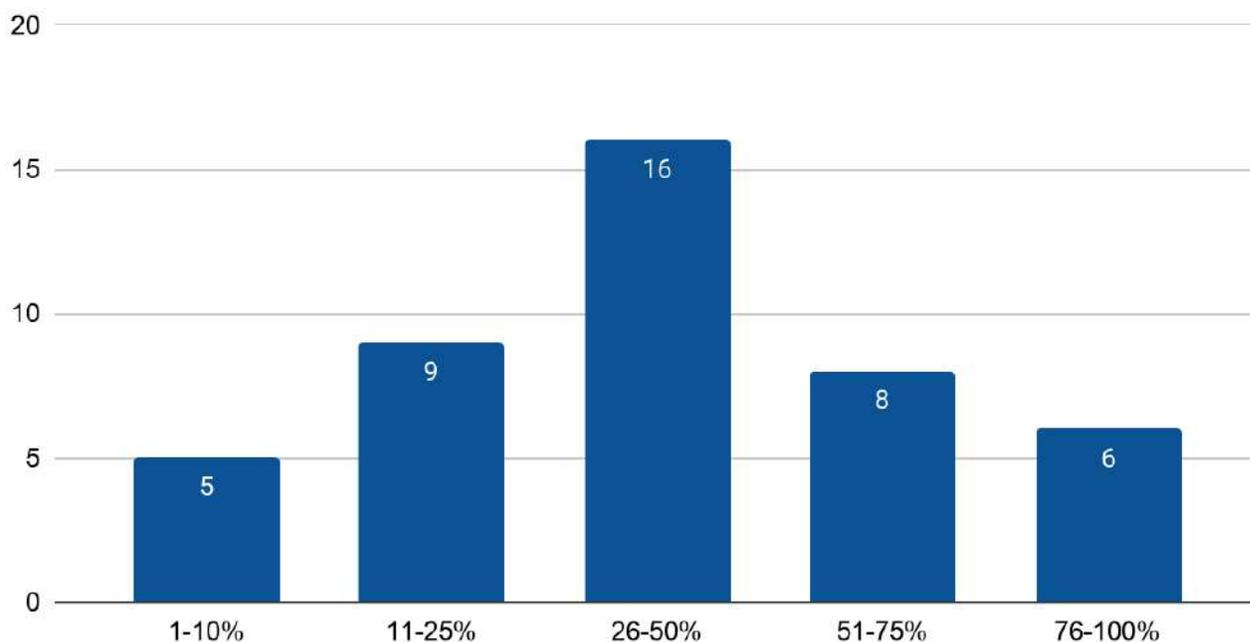
5. To what extent are girls encountering women in the roles of fellow students and teachers in their STEM courses?

Figures 11, 12, and 13 below identify some discouraging trends in relation to the gender differences found in STEM fields, but also a slightly positive trend overall: that STEM Conference alumnae are witnessing some progress in narrowing the national gender gap in STEM studies as they progress through high school. While this gap historically manifests in the number of female role models young women encounter as teachers as well as among their peers in classes, the charts below show that there is an apparent shift in the number/percentage of females feeling empowered to take STEM classes in high school (Figure 11). This may be due to the many initiatives advanced especially over the past decade or so to encourage females toward STEM fields and STEM interests.

Data, however, indicate that the gender gap in STEM fields is still in full effect nationwide. Data published in July 2020 by Cornell² show that by senior year of high school, 26 percent of boys plan to enter STEM studies in college while only half that percent (13 percent) of girls have the same plan. Data trends are still highly favoring males in completion of STEM degrees as well, with 18 percent of males graduating with a degree in a STEM field compared to 8 percent of female college graduates (same source). While national college-level trends are still showing a significant gender gap, there are positive insights to be gleaned nonetheless from the data gathered herein regarding alumnae estimates of female peers and instructors of math and science classes.

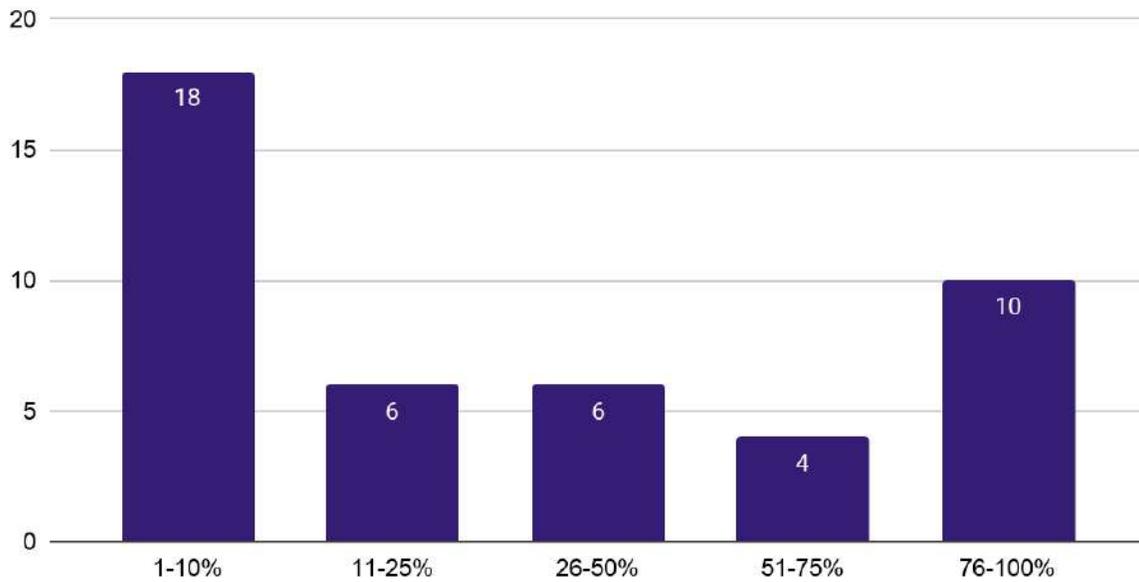
A positive trend was noted in the estimates made by surveyed Career Conference alumnae in their math and science teaching staff. Over half (23 of 44 respondents) estimated 50 percent or greater of their math and science classes were taught by a female instructor. While this still means that a greater percentage of math and science classes are being taught by men, this seems to be somewhat of a move in the right direction.

Figure 11. Of your high school mathematics and science classes, what was the percentage of classes taught by a female instructor? (Q10)



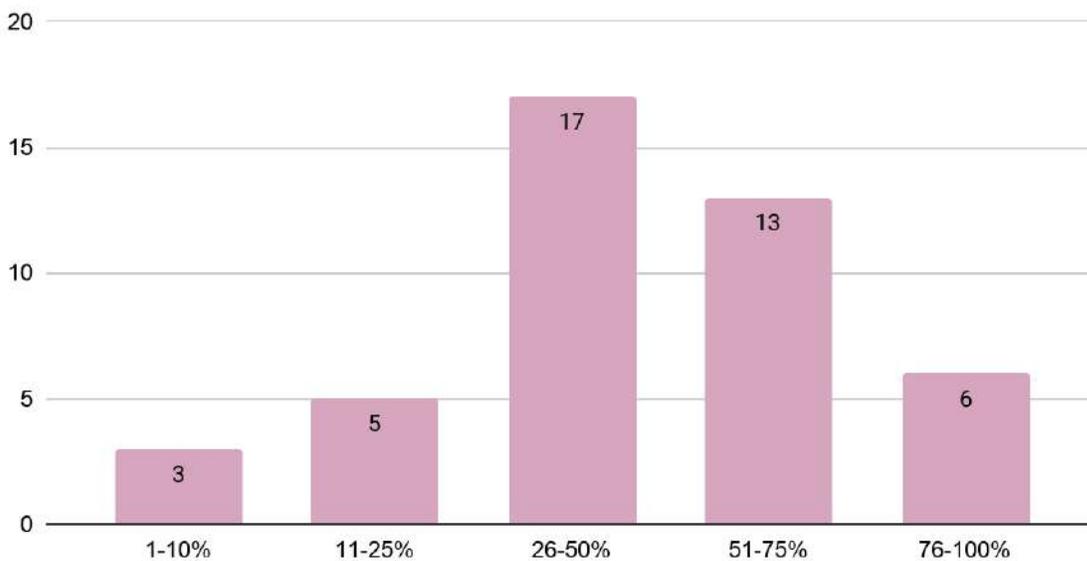
At a higher level of STEM coursework (i.e., Advanced Placement (AP) classes for STEM), it appears that fewer female role models exist and the gender gap still clearly dominates. Based on Career Conference alumnae's estimates, it was discouraging to see that only 43 percent of respondents estimated half or more of their AP classes were taught by females. Even more discouraging in this data set was that nearly the same percentage - 41 percent - of STEM Career Conference alumnae estimated that 10 percent or less of their AP STEM courses were taught by a female instructor.

Figure 12. Of your AP mathematics and science classes, what was the percentage of classes taught by a female instructor? (Q11)



The most exciting outcome of this data, however, was the percentage of respondents who estimated half or more of their classmates in math and science classes were female rather than male – a high 68 percent of alumnae. Also encouraging was that only 8 of 44 respondents (18 percent) estimated 25 percent or fewer of their classmates were female.

Figure 13. Of all of your high school mathematics and science classes, what was the percentage of class members who were female? (Q12)



There are still significant strides to be made in the area of closing the gender gap in the STEM fields. However, there are glimmers of hope that can be pulled from these up-to-date data regarding what females are encountering amongst their peers in high school STEM coursework.

6. To what careers do past attendees aspire?

All survey respondents were asked what careers they are considering. All 44 students answered the question, and 46 percent of those affirmed they are planning a career in a STEM field, with another 36 percent indicating they were uncertain. Of those noting they were planning a STEM-related career, target careers ranged from biochemist and environmental scientist to surgeon and forensic pathologist. Responses include:

- Nurse (noted by 3)
- Electrical engineer
- Civil engineer
- Surveying engineer
- Psychiatrist
- Biochemist
- ER surgeon
- Dermatologist
- NASA
- Environmental scientist
- Biologist (named by 2)
- Pediatrician
- Computer software engineer
- Cardiothoracic surgeon
- Surgeon (general)
- Urban planning/designer
- Forensic pathologist

STEM Career Conference alumnae from 2015 and 2016 shared in their own words the impact of the conference on energizing their interest in STEM-related fields for career choices and decisions as they progressed through high school.

I was exposed to a wide array of STEM careers that I previously knew nothing about. It also encouraged me to explore options for a career in STEM.

I was intrigued by one specific session: sustainable engineering. Having done little to no research on the topic, I decided to sign up for it anyways because it sounded “cool.” During the sustainable engineering session, I was able to work on a green roof project. The discovery I made in that session has shaped my future endeavors. I attended a math and science school to further my understanding of engineering, and during my junior and senior year I decided to participate in environmental focused programs to be better

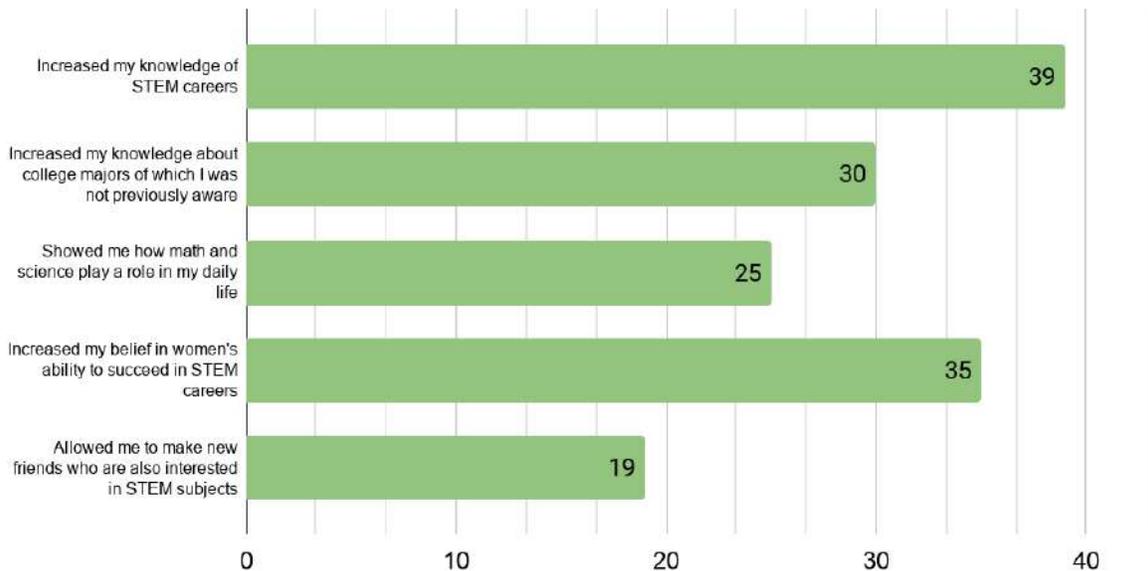
equipped about our environment and the issues we are facing. I became interested in the field of environmental engineering with a concentration in sustainability. The STEM Career Conference sparked an interest in engineering for me, and the session with sustainability led me to Urban Planning and Designing. I will continue my studies in these upcoming years in college with a major in Urban Planning and Designing. This conference provided a gateway to my future.

The STEM Career Conference intends to do just this - provide a gateway to the future of middle school girls to consider how they might not only select and pursue STEM in their studies, but also alter the course of their life by shaping their career choices.

7. What impact did the STEM Career Conference have on girls' self-confidence, identity, and attitude toward STEM?

STEM Conference alumnae were asked to indicate which of five suggested effects their conference experience had on them. Figure 14 below shows alumnae rated "increased my knowledge of STEM careers" highest (89 percent). The second-highest rated effect was "increased my belief in women's ability to succeed in STEM careers" (80 percent).

Figure 14. Did attending the STEM Career Conference have any of the following effects on you? (Q5)



STEM Career Conference alumnae described in their own words how their attendance affected their knowledge about STEM as a valid potential pathway at an early stage of schooling:

I don't quite remember the details as vivid as I can recall the impact the STEM Career Conference left on me. I walked out with so much more knowledge that I came into the conference and realized there are so many more things you can learn. STEM isn't just simply science, technology, engineering, and math. It branches out into much more complex systems that offer millions of career opportunities for men and women.

I knew I've always liked science, but the STEM conference made me more aware of the careers available to me in the science field.

8. What was most important to attendees about their STEM Career Conference experience?

Survey question 4 asked alumnae to select how important each of six aspects of their conference attendance was to them, on a scale spanning “Not Important,” “Somewhat Important,” “Very Important,” and “Most Important.” The results (Figure 15) show a clear preference for hands-on activities by 99 percent of respondents, of whom 52 percent rated this aspect as “Most Important.” Similarly impactful was meeting women who have jobs in STEM-related careers, as the most attendees (57 percent) rated this as the most important aspect of their conference experience, and all but one attendee of the 44 survey respondents found this to be important in their experience.

Figure 15. Thinking about your experience at the STEM Career Conference, how important were the following (Q4)

	Not Important	Somewhat Important	Very Important	Most Important
Being with other girls my age interested in STEM	2.3% (1)	11.4% (5)	61.4% (27)	25.0% (11)
Learning about STEM-related careers in the workshops	2.3% (1)	13.6% (6)	45.6% (20)	38.6% (17)
Meeting women who have jobs in STEM-related careers	2.3% (1)	4.6% (2)	36.4% (16)	56.8% (25)
Hands-on workshop activities	0.0% (0)	4.6% (2)	43.2% (19)	52.3% (23)
Keynote Speaker's address at beginning of conference	4.6% (2)	22.7% (10)	54.6% (24)	18.2% (8)
Attending the conference on a college campus	2.3% (1)	18.2% (8)	43.2% (19)	36.4% (16)

Those who responded that the keynote speaker's address at the beginning of the conference was the most important, were all attendees from the same year (2016), which may indicate a particularly inspiring speech or speaker that year. Whatever the message or whomever the speaker, there were many young girls inspired by the keynote speech.

The best way to sum up the impact of the STEM Career Conference as a life-changing experience for middle school girls, one that energizes potential with long-lasting impacts that stretch far beyond one day in the life of a young woman, is to once again look directly to the words of alumnae as they describe the bigger picture.

I was back and forth about majoring in a STEM (subject) because I knew not a lot of women choose to major in those aspects but the conference made me realize there were many girls of my age that were interested in majoring in STEM and it really influenced me to choose a STEM major.

The effect that the STEM Career Conference had on me was that I was able to accept the fact that we females can do anything our hearts and mind desire. And coming from a family, or more so a father, who believed that a female's role in life is to be in the kitchen and taking care of the kids, showed me that we must defy these gender stereotypes.

The STEM Career Conference affected me greatly because it made me realize that women are very important and deserve to accomplish whatever their heart desires. Also, listening to and watching the amazing women who had STEM jobs made me have a greater perspective on work ethic and how strong and independent us women are.

The AAUW LB STEM Career Conference is achieving its goals of empowering females, shaping their studies, and energizing their desire to have careers in STEM fields. Alumnae are taking away a plethora of insights, experiences, and values that are changing their lives.

Survey Findings References

¹ U.S. Department of Education, National Center for Education Statistics. (2019). *Digest of Education Statistics, 2018* (NCES 2020-009), [Chapter 3](https://nces.ed.gov/programs/digest/d20/tables/dt20_302.10.asp) at https://nces.ed.gov/programs/digest/d20/tables/dt20_302.10.asp

² Cornell Chronicle, "Gender Gaps in STEM College Majors Emerge in High School", Kate Blackwell, July 1, 2020 at <https://news.cornell.edu/stories/2020/07/gender-gaps-stem-college-majors-emerge-high-school>

CONCLUSION

The AAUW LB STEM Career Conference is achieving its goals of encouraging traditionally underserved students to select STEM courses in high school, motivating girls to pursue a college education, and inspiring them to enter STEM careers. Survey results indicate that the majority of the respondents elected to take more science and advanced math classes in high school after attending the Conference. The STEM Career Conference participants from 2015 and 2016 markedly outpaced their non-participant peers in completion of AP courses in high school. Fully half of survey respondents reported the STEM Career Conference resulted in them changing their high school math and/or science pathway choice. All of the 44 survey respondents graduated from high school and plan to attend college. Eighty percent (131 of 163) of the 2015 and 2016 cohorts' seniors (those giving permission to have their courses tracked), enrolled in college, which compared well with the 66.2 percent 2019 national average. Close to 50 percent of the survey respondents intend to major in STEM fields.

Surveyed alumnae describe the Conference as having had an enduring impact on their self-confidence, identity, and attitude toward STEM. Eighty-six percent of survey respondents report the STEM Career Conference boosted their self-confidence in their ability to succeed in their science classes; 86 percent feel their experience gave them greater confidence in their ability to do well in school overall; and 75 percent reported the conference boosted their self-confidence in their math classes. Twenty percent of the respondents shared that they had participated in other STEM activities after the Conference. Meeting women in STEM fields, participating in hands-on activities, being inspired by the keynote speaker, and being among peers who also were excited about STEM, all ranked highly with the survey respondents.

These outcomes provide a path forward for those organizers who wish to emulate the format of the AAUW Long Beach STEM Career Conference. They also validate and justify the support by sponsors and volunteers to provide an inspiring 2.5-hour STEM experience for young women from underserved communities. These middle school girls are indeed being inspired to take the steps necessary to enter fields where they can be mentally challenged, can make a difference in their world, and can earn higher wages to support themselves and their families.

ACKNOWLEDGMENTS

The *Energizing Potential* evaluation process occurred over a 7-year time span. In addition to the 44 young women who responded thoughtfully to the survey, the AAUW Long Beach Research Co-Chairs, Mary Lamo, Frances Rozner and Raquel Sanchez, wish to acknowledge the encouragement of the AAUW Long Beach branch membership and the special contributions of the following individuals:

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APPENDIX A

AAUW LB STEM Career Conference Workshop Careers

2015

Audiologist
Automotive Production Engineer
Chemical Engineer
Chiropractor
Dietitian
Environmental Scientist
Financial Professional
Public Health Nurse
Structural & Civil Engineer
Sustainability Engineer

2016

Automotive Production Engineer
Chemical Engineer
Coroner
Dietitian
Environmental Scientist
Financial Advisor
Human Factors Researcher
Public Health Nurse
Structural & Civil Engineer
Sustainability Engineer

APPENDIX B

Postsecondary Institutions Attended by Conference Alumnae

Postsecondary Institution Name	Number of 2015 Alumnae Attending	Number of 2016 Alumnae Attending
CALIFORNIA POLYTECHNIC STATE UNIVERSITY	3	1
CALIFORNIA STATE UNIVERSITY - CHICO	0	1
CALIFORNIA STATE UNIVERSITY - DOMINGUEZ HILLS	1	1
CALIFORNIA STATE UNIVERSITY - EAST BAY	0	1
CALIFORNIA STATE UNIVERSITY - FULLERTON	1	0
CALIFORNIA STATE UNIVERSITY - LONG BEACH	22	25
CALIFORNIA STATE UNIVERSITY - LOS ANGELES	1	0
CALIFORNIA STATE UNIVERSITY- NORTHRIDGE	0	2
SAN JOSE STATE UNIVERSITY	0	1
SONOMA STATE UNIVERSITY	0	1
<i>CALIFORNIA STATE UNIVERSITY - ALL CAMPUSES</i>	28	33
CERRITOS COLLEGE	1	0
CLAFLIN UNIVERSITY	1	0
COMPTON COLLEGE	1	2
LIFE UNIVERSITY	0	1
LONG BEACH CITY COLLEGE	24	22
MICHIGAN STATE UNIVERSITY	1	0
PENNSYLVANIA STATE UNIVERSITY	0	1
PEPPERDINE UNIVERSITY	0	1
SACRAMENTO CITY COLLEGE - LOS RIOS CC DIST	1	0
ST CLAIR COUNTY COMMUNITY COLLEGE	1	0
TUSKEGEE UNIVERSITY	1	0

Postsecondary Institution Name	Number of 2015 Alumnae Attending	Number of 2016 Alumnae Attending
UNIVERSITY OF CALIFORNIA - IRVINE	0	1
UNIVERSITY OF CALIFORNIA - LOS ANGELES	2	0
UNIVERSITY OF CALIFORNIA - MERCED	0	3
UNIVERSITY OF CALIFORNIA - RIVERSIDE	0	2
UNIVERSITY OF CALIFORNIA - SANTA BARBARA	1	0
UNIVERSITY OF CALIFORNIA - SANTA CRUZ	1	0
UNIVERSITY OF CALIFORNIA - ALL CAMPUSES	4	6
UNIVERSITY OF NEVADA LAS VEGAS	0	1
UNIVERSITY OF SOUTHERN CALIFORNIA	0	1
Total	63	68

APPENDIX C

Alumnae Survey for the Participants of the AAUW Long Beach STEM Career Conference

The 2020 Alumnae Survey is available on the following pages. The questions in the 2019 Alumnae Survey were exactly the same, with several text accommodations made for the year of actual Conference attendance.

2020 Alumnae Survey for Participants of the 2016 AAUW Long Beach STEM Career Conference

The American Association of University Women (AAUW) Long Beach branch, coordinator of the STEM Career Conference, has hired an independent evaluator to collect information from you on the impact of your 8th-grade conference attendance on your high school science and math course choices. Your candid answers will help us make the conference better for all girls who attend in the future. The survey should take no longer than 10 minutes. Please complete each page before moving to the next; you will be able to go back and change your answers if necessary. Thank you for your honesty, time and cooperation in completing this important survey. If you provide your name and contact information at the end of the survey, you will receive a \$10 gift card for your effort and be entered into a drawing to receive a \$75 gift card. Your responses and contact information will remain confidential.

Part 1 – General Information

1. Middle School attended at the time of the conference:
 - Franklin
 - Hamilton
 - Jefferson
 - Muir
 - Powell
 - Robinson
 - Other: (Please provide middle school name)

2. High School currently attending:
 - Beach High School
 - Cabrillo High School
 - California Academy of Math & Science (CAMS)
 - EPHS (Educational Partners)
 - David Star Jordan High School
 - Jordan Plus
 - Lakewood High School
 - McBride Senior High School
 - Robert A Millikan High School
 - Polytechnic High School
 - PAAL
 - Will J. Reid High School
 - Renaissance High School for the Arts
 - Sato Academy
 - Woodrow Wilson Classical High School

 - Other (Please specific)

3. Please provide your race/ethnicity below. Do you consider yourself...
(Select one or more.)
 - Alaska Native

- Native American
 - Asian
 - Black or African American
 - Hispanic or Latino
 - Middle Eastern
 - Native Hawaiian or other Pacific Islander
 - White
 - Other
4. At the time that you attended the STEM Career Conference, did one or both parents or guardians work in a STEM-related job?
- No
 - Yes – one parent or guardian
 - Yes – both parents or guardians
 - Not sure

Part 2 – Survey Questions

1. The STEM Career Conference increased my interest in:
(Scale: Strongly Disagree, Disagree, Not Sure, Agree, Strongly Agree)
- Science
 - Technology
 - Engineering
 - Mathematics
2. The STEM Career Conference gave me greater confidence in my ability to be successful in
(Scale: Strongly Disagree, Disagree, Not Sure, Agree, Strongly Agree)
- Math classes
 - Science classes
 - My ability to do well in school overall
3. Because of my attendance at the STEM Career Conference, I did the following:
(Scale: Strongly Disagree, Disagree, Not Sure, Agree, Strongly Agree)
- Took more advanced math classes in high school
 - Took more science classes in high school
 - Took more computer science classes in high school
4. Thinking about your experience at the STEM Career Conference, how important were the following:
(Scale: Not Important, Somewhat Important, Very Important, Most Important)
- Being with other girls my age interested in STEM
 - Learning about STEM-related careers in the workshops
 - Meeting women who have jobs in STEM-related careers
 - Hands-on workshop activities
 - Keynote Speaker's address at beginning of conference
 - Attending the conference on a college campus
5. Did attending the STEM Career Conference have any of the following effects on you? (Check all that apply)
- Increased my knowledge of STEM careers

- Increased my knowledge about college majors of which I was not previously aware
- Showed me how math and science play a role in my daily life
- Increased my belief in women's ability to succeed in STEM careers
- Allowed me to make new friends who were also interested in STEM subjects

In your own words, please describe more fully what effect the STEM career conference had on you?

- Did attendance at the STEM Career Conference result in you changing your high school math/science pathway choice?
 - Yes
 - No
- While in high school, have you participated in other STEM after/outside-of-school activities?
 - Yes
 - No

If yes, what was the most impactful STEM after/outside-of-school activity in which you participated?
- Which of the following non-AP mathematics or science classes did you successfully complete and/or expect to complete by the end of your senior year of high school? (Check all that apply)
 - Algebra
 - Algebra II
 - Geometry
 - Trigonometry/Pre-Calculus
 - Calculus
 - Biology
 - Chemistry
 - Physics
 - Physiology
 - Earth science
 - Computer science
 - Engineering
 - None
 - Other (Please list):
- Which of the following College Board AP mathematics and science courses did you take in high school and/or expect to complete by the end of your senior year of high school? (Check all that apply)
 - AP Biology
 - AP Calculus AB
 - AP Calculus BC
 - AP Chemistry
 - AP Computer Science A
 - AP Environmental Science
 - AP Physics 1
 - AP Physics C: Electricity and Magnetism
 - AP Physics C: Mechanics
 - AP Statistics
 - Other (Please list):

10. Of your high school mathematics and science classes, what was the percentage of classes taught by a female instructor? (Give your best estimate)
11. Of your AP mathematics and science classes, what was the percentage of classes taught by a female instructor? (Give your best estimate)
12. Of all of your high school mathematics and science classes, what was the percentage of class members who were female? (Give your best estimate)
13. Are you on track to graduate from high school this year?
 - Yes
 - No
14. Are you planning to attend college?
 - Yes
 - No (Reason: _____)
 - Not sure (Reason: _____)
15. What is your college plan?
 - Attend a 2-year college
 - Attend a 2-year college, transitioning to a 4-year college
 - Attend a 4-year college directly
 - Starting college in a year or two
 - Not attending college.
16. What is your anticipated college major? (Check all that apply)
 - Biology
 - Chemistry
 - Computer Science
 - Earth/Environmental Science
 - Engineering
 - Forensic Science
 - Mathematics
 - Physics
 - Social Science (Psychology, Sociology, Anthropology)
 - Business
 - Communications
 - Humanities (Art, English, Music, Theater Arts)
 - Other (please specify)
 - I don't know
 - Not attending college
17. Are you planning a career in a STEM field?
 - Yes
 - No
 - Not sureIf yes, please describe your target career.

Contact Information for drawing:

Name: _____

Email address: _____