Celebrate

swe™

OUTREACH

2022-2023

Letter from the Editor

Another fiscal year concludes as the Special Publications Work Group takes the pleasure of presenting the annual issue of Celebrate SWE Outreach. In my fourth year as editor of this publication, I express gratitude to the returning and new members of the Outreach Committee, who commit many hours promoting STEM education for K-12 students and adult advocates. My praises and gratitude to this incredible group of volunteers who continue to be consistently consistent in the level of personal dedication, creativity, and professionalism to share the work and effort of a dynamic organization.

I have spent the last year pondering about what success means to me. And, over time, it is clear to me that I have measured personal success in many different ways: making a new friend, earning my target grade in a class, teaching a student about parallel circuits, publishing a magazine, or getting that next promotion. This year, as much as I had my own successes, what I enjoyed most was celebrating the wins of my work group members. Whether it was personal, professional, or outreach-related, I loved that I could smile during every meeting with this team. They have been a constant in my life over the last four years. With a blend of talents, working separately and together we have achieved more than I could have imagined. I encourage you to use that mindset in your outreach.

We do not volunteer to promote ourselves, as most of these students may never remember our names. Instead, they will likely recall some of the knowledge and opportunities shared. Maybe they will remember our special encouragement and kindness. We strive to share with each student their individual growth with each SWE activity that may result in them adding to industry and potentially being part of the next generation of engineer technologists, and scientists.

Join us as we reflect on the Outreach and SWENext accomplishments created by our SWE volunteers this year. We hope this work inspires you to continue sharing. To be part of this community is to celebrate together and bring more bright minds into disciplines we all love.

Elizabeth Gjini
FY23 Special Publications WG Lead

Special Publications Work Group

Elizabeth Gjini (WG Lead)
Sara Wheeland
Hilary Fiorentino
Jacquelynne Hernández
Meagan Olsen
Juliana Yang
Celeste Gideon
Kerry Moriarty Lyman
Tuyet-Hanh Schnell

Table of Contents

*All links are up to date as of July 2023

Special thanks to our SWE HQ and Leadership Team

Markita Riley
Manager, Student Programs

Enanga Daisy Fale
Director, Board of Director

Meet the Outreach Committee

& More!

Leadership

FY23 has been a blast. Our committee members are so creative. Quick summary:

We have a team of more than 80 rock-star volunteers who created extensive resources for adult advocates to share science, technology, engineering, and mathematics (STEM) concepts, projects, and activities across the globe. These vary from (a) addressing the myths of STEM options with high school students to (b) a virtual get- together, to (c) an outreach of best practices; to (d) a children's book on the brink of publication. We are ready to continue this momentum into another great year.

-- SWE Outreach Committee Leadership

Outreach Committee

Chair - Swetha Vinjimoor
Chair Elect - Leah Baker

SWENext Committee

Chair - Sahara Becker
Chair Elect - Elizabeth Heyde

Adult Advocacy Publications Work Group

The **Adult Advocacy Publications Work Group** works to increase science, technology, engineering, and mathematics or STEM awareness and engagement by publishing a monthly newsletter with resources for Adult Advocates to aid in supporting girls in STEM-related fields. These newsletters contain articles on, but are not limited to, resources available through SWE, current events, famous women, outreach tips and tricks, social research, careers in engineering fields, and highlights for various trainings from the SWE Advanced Learning Center. The group has also brought on a high school student to write articles under the mentorship of a work group member.

Visit the SWENext Publications page to find past issues of the Adult Advocate newsletter.

Interested in receiving a copy of the monthly Adult Advocate newsletter? Fill out this Adult Advocate Newsletter sign-up form.

Adult Advocacy Publications Work Group

Kristina Phillips, Amanda Tijerina, Lily Coss, Sandra Kirby, Abby Mitchell, Debra Kimberling, Geetha Arun, Uma Mudumba, Shaikh Sameera, Gowri Ramaprasad

Global Outreach Work Group

The **Global Outreach Work Group** provides support for adult advocates abroad. Ensuring those representing our boots-on-the-ground network have the resources and training available to share science through SWE effectively, is key for expanding the this outreach group's impact. This year, the team has focused their efforts on 4 key geographies: India, Nigeria, Brazil and Kenya.

The first goal was to understand what resources are currently available in each region. We achieved this task via a survey feedback from our network of global affiliates. Next, the feedback was utilized to develop a one-page guide with content catering to the gaps indicated. The most notable pain points included proper funding, lack of adult advocates in the area, and clarity regarding SWENext programming. The Global Work Group compiled current resources and created something innovative with their guide. Guides were tailored to the specific needs of each geography before being shared with our world wide audience.

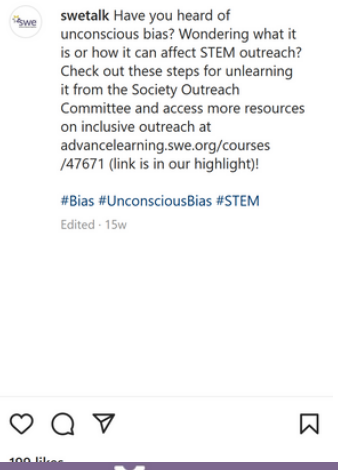
Interested in getting involved on a global scale? Sign up for the global newsletter or join a Global Affiliate!

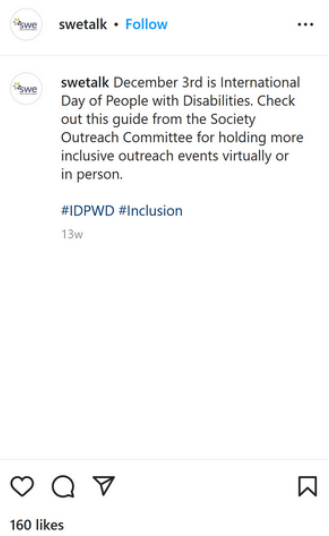
Global Outreach Work Group

Leah Baker, Karen Ochie, Winifred Ereyi, Tracy Nguyen, Inga Urbina, Chetana Gorle, Mulikat A. L. Idris, Beamlak Abate, Gisella Lamas, Uma Mudumba, Bailey Brandel

DEI in Outreach Work Group

The **Diversity, Equity, & Inclusion in Outreach Work Group** is primarily focused on creating educational resources for members to use and share. Topics include how to create more inclusive outreach events, how to engage underserved youth, bias, event accessibility, and more. The group shares content through social media as well as through SWE's Advanced Learning Center.





Global Outreach Work Group

Maddy Best (WG Lead), Diana Berry, Emily Tacopina, Melanie Hunt, Oluremi Hamid, Katrina Bliss, Lisa Cervia

Outreach Challenges Work Group

The **Outreach Challenges Work Group** is responsible for developing outreach-based "challenges" that encourage sharing of best practices and exceptional outreach ideas between SWE members. To learn more about how different sections are developing outreach programming and engaging with educators, parents/families, and other adult advocates, this year's contest asked sections to put together short, pitch-style presentations about their outreach solutions to present to a panel of outreach specialists. Participating sections had the opportunity to win cash prizes to support their outreach efforts.

Congratulate the winners of this year's outreach challenge:

First Place: SWE FCT Abuja (Nigeria), presented by Stella Uzochukwu-Denis, Vivian Okoli, and Loveth Chukwuyem - prize of $1,500

Second Place: SWE Liberia, presented by Dorothy Gocol, Christiana N'Tow-Kulah, and Edith Tarplah - prize of $1,000

Third Place: SWE at Michigan Technological University, presented by Skyler Brawley, Gretchen Hein, and Carsyn Boggio - prize of $750

Outreach Challenges Work Group

Erika Yegerstrom (WG Lead), Sanchya Mahajan, Sam Balistreri, Kaelee Mader, Denise Athaide, Elva Carusiello

Outreach Metric Tool Work Group

The **Outreach Metric Tool/Youth Protection Program Chair** is responsible for updating and reporting on submissions to the Outreach Metric Tool, as well as reminding members and ensuring adherence to the Youth Protection Plan training requirements. These programs help SWE to track outreach involvement and ensure all students participating in outreach events are safe. More information on outreach assessment can be found here.

The Society of Women Engineers (SWE) is committed to providing a safe and secure environment for all participants in SWE- sponsored youth-focused programs throughout the world. Youth protection requires continued vigilance, and we work every day to protect children through appropriate policies and procedures at every level of our organization.

SWE's Youth Protection Policy and supporting documents (SWE Advocacy Code of Conduct and SWE's Bullying Prevention Guide) explain requirements and expectations for interacting with youth at SWE-sponsored events and activities across multiple event types and situations.

All volunteers and staff interacting with youth, including SWE youth advocacy leadership, must complete the following steps:

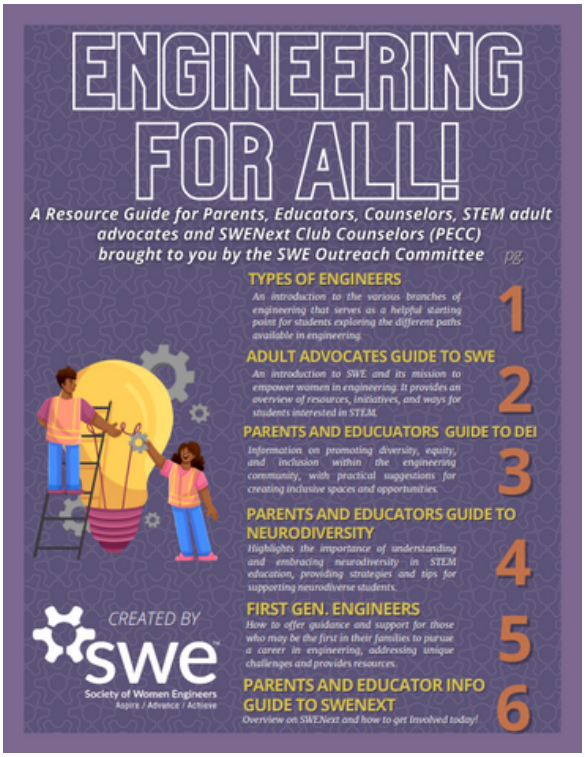
1. Review the three documents and act in accordance with this policy.
2. Complete the required training course every three years.
3. Acknowledge agreement with the code of conduct and standards for interacting with youth.

Outreach Challenges Work Group

Lucy Kurtz (WG Lead), Samantha Balistreri

Training for Parents, Educators, and SWENext Club Counselors Work Group

The **Training for Parents, Educators, and SWENext Club Counselors Work Group** focuses on developing helpful outreach content for these parties. This year, the focus was on engaging educators. The group created a set of flyers about topics such as how to sign up for SWE, how to encourage students to join SWENext, and how to navigate neurodiversity in the classroom. The group also created social media posts to reach an even greater number of educators in the SWE and work group networks.



Training for Parents, Educators, and SWENext Club Counselors Work Group

Sydney Robinson (WG Lead), Nicole Wettstein, Megan Fischer, Karin Metzgar, Jessica Yakwo, Jordan Mahoney, Katrina Thompson, Maribel Cassens, Sami Low, Katherine Boylin

Invent It. Build It. Work Group

The **Invent It. Build It. Work Group** oversees the Invent It. Build It. (IIBI) event for girls in grades 6-12 at the annual WE conference. At this year's IIBI event, hosted during WE22 in Houston, girls participated in hands-on engineering activities and learned about how engineers help people and make a difference in the world. Additionally, the event includes a parent's and educator's program for information on engineering careers and scholarships and an EXPO featuring SWE members from different engineering disciplines, engineering clubs, engineering camps, competitions, after-school programs, and activities from exhibitors from corporations and the local community. The EXPO concluded with a huge dominos drop that spelled out SWENext. Three parts of the event are detailed below.

The **IIBI High School Program** seeks to create an environment for building a strong foundation and generating excitement to engage students. The team continued with the three-part rally challenge to get the students to flex their creative and problem solving muscles with an open ended challenge with many building materials. To increase the complexity of the solutions, a new rubric was introduced which gave higher scores to teams that used complex mechanisms and delivered the driver safely to the end point. For the third year, Tamara Robertson served as the emcee for the event.

Invent It. Build It. Work Group

This year saw the return of the **Middle School Program** to IIBI, and the team couldn't have been more excited! The room was buzzing with kids building and testing a wind power station. They learned about creating energy and made their own wind turbines while applying the engineering design-build-test philosophy. Deysi Melgar returned as the emcee for the program.

A third major component of IIBI's success happens in the **Parent Educator Program (PEP)** room. Program leaders and panelists shared information on why engineering is a great career choice for girls, provided practical ideas and resources, and answered questions. Following a brief presentation about engineering, they held an hour-long Q&A session with three women engineers and a Girl Scout Council leader as panelists. Afterwards, participants could choose to learn about the engineering design process by participating in a hands-on activity or go to a separate room for an Educators Round Table discussion. The event ended with final thoughts and a raffle.

Invent It. Build It. Work Group

Dana Day, Jessica Farmer, Sydney Senger-Thompson, Lori Kahn, Cindi Reid, Mary Issac, Jess Sorick, Mary Zeis, Stella Uzochukwu-Denis, Sydney Robinson, Erin Saywer, Jess Lunte, Tuyet-Hanh Schnell, Sarah Johnson

Special Publications Work Group

The **Special Publications Work Group** focused on two major projects this year: the FY23 *Celebrate SWE Outreach!* magazine and an upcoming children's book.

The publication you are reading — the FY23 issue of *Celebrate SWE Outreach!* — is a compilation of the accomplishments from the Outreach and SWENext Committees. We are committed to sharing the resources and activities these groups have created throughout the year. You can view the past FY22, FY21, and FY20 issues at the provided links.

The second project is a new, upcoming book for middle-school students featuring stories from SWE members at various levels of their careers. The work group is currently conducting interviews with selected candidates, writing stories, and creating beautiful art. Stay tuned in the coming years for more information on how to obtain a copy.

Special Publications Work Group

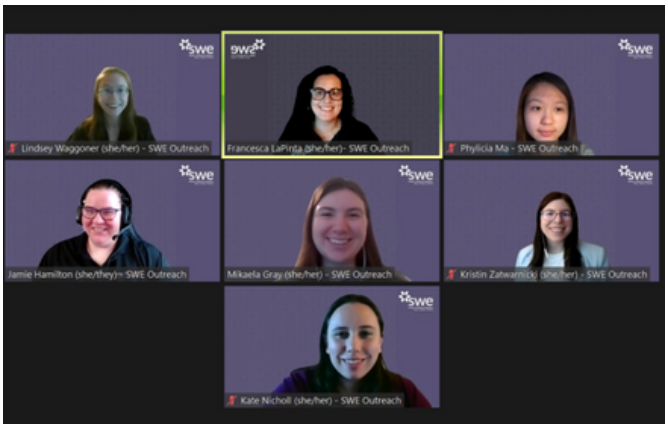
Elizabeth Gjini (WG Lead), Sara Wheeland, Hilary Fiorentino, Jacquelynne Hernández, Meagan Olsen, Juliana Yang, Celeste Gideon, Kerry Moriarty Lyman, Tuyet-Hanh Schnell

Introducing Engineering Concepts Work Group

The FY23 **Introducing Engineering Concepts Work Group** developed a webinar presented in April 2023 to give Adult Advocates the resources and knowledge necessary to support secondary-school students in their potential pursuit of STEM fields. This year, along with the focus on secondary-school students, the committee decided to focus its efforts on "mythbusting" and challenging preconceived notions about STEM fields that students have. The three "myths" focused on in the webinar were:

1. You need a traditional four-year degree to enter STEM fields
2. The major you choose decides your whole career
3. You have to be a math person or a creative person; you can't be both

In each of the sections, Adult Advocates had the opportunity to learn about non-traditional STEM paths like trade school, the importance of knowing the difference between engineering roles like design engineer vs. quality engineer, the interconnectedness of STEM and art, and more. By challenging these perceptions, students will be able to better see the vast number of opportunities that exist in STEM. The webinar is available on SWE's Advance Learning Center for future viewing.



Introducing Engineering Concepts Work Group

Jamie Hamilton, Lindsey Waggoner, Kate Nicholl, Mikaela Gray, Phylicia Ma, Kristin Zatwarnicki, Francesca LaPinta (WG Lead)

SWENext Clubs Work Group

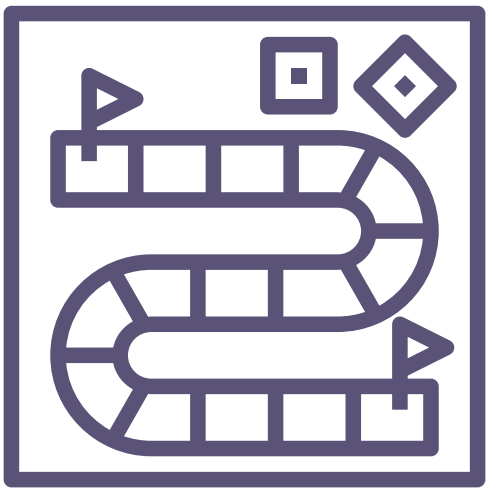
The **SWENext Clubs Work Group** designs resources and activities for SWENext Clubs around the world! From organizing the SWENext Clubs Challenge to writing detailed guides for both students and professionals to build and grow their SWENext clubs, the SWENext Clubs Work Group is here for everything clubs. Our goals are to understand any challenges that clubs face and create opportunities that can help clubs learn, sustain, and develop based on those challenges. Check out our resources here. All of these resources are translated into Spanish, German, and Portuguese!

SWENext Clubs Work Group
Bekah Travis (WG Lead), Stephanie Poole, Marie Laplante, Cassidy Elwell, Laurie Ramsay

SWENext Transitions Work Group

The **SWENext Transitions Work Group** creates content and provides benefits to help guide students through major transitions in their STEM pathway. These include transitions such as from middle school to high school and from high school to college. The Work Group sends out Scholarship Tips that help SWENexters apply for SWE scholarships, Transition Tips that help graduating high school SWENexters with their transition into college, and annually updated Milestones to College documents (for freshmen, sophomores, juniors, and seniors). These resources provide useful tips and tricks to help guide SWENexters through their high school path towards a STEM future.

The Work Group also hosts an annual Uncommon Engineering Major webinar where experts in less well-known fields share their career stories and fields with students interested in potentially pursuing an unconventional field. Every summer, the Work Group also introduces graduating SWENext seniors to the SWE Collegiate Section at their chosen colleges. They also have a playlist of submitted videos from SWE Collegiate Sections to help SWENexters research their college choices.



SWENext Transitions Work Group
Stella Chukwu, Katrina Thompson, Vivian Okoli, Christiana Aguirre, Gayatri Pahapale, Annie Ding (WG Lead), Aishwarya Balaje, Julia Hines

SWENext Publications Work Group

The **SWENext Publications Work Group** coordinates, writes, and publishes monthly newsletters for the K-8 and high school (HS) SWENext community. A variety of topics are communicated in each newsletter catering to the particular audience based on events occuring that month, general engineering details and advice, highlights of exemplary SWENexters and clubs, and hands-on activities to learn about STEM.

The K-8 newsletter typically consists of a description of an engineering discipline that is being highlighted that month, a corresponding activity to learn about that discipline in a hands-on way, as well as an interview with a college student studying that discipline, highlights of national holidays, and other miscellaneous topics to help K-8 students better understand engineering.

The HS newsletter has a more detailed description of a particular engineering discipline and an interview ith an industry or academic professional, advice throughout the year about engineering and college, highlights of SWENext clubs and information on how to start your own, and more!

If you are interested, make sure to subscribe to the monthly newsletters and view the blog and social media posts!

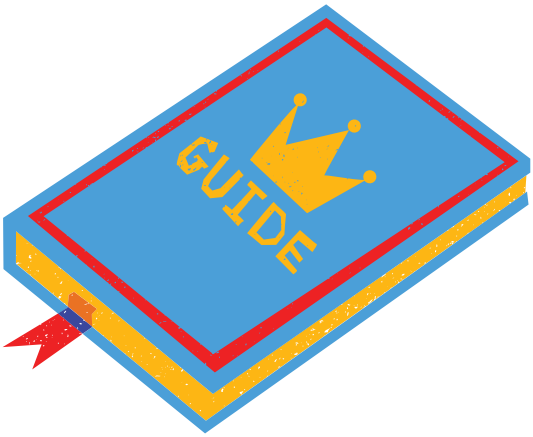
SWENext Program (13 and over)
SWENext Progam (13 and under parents)

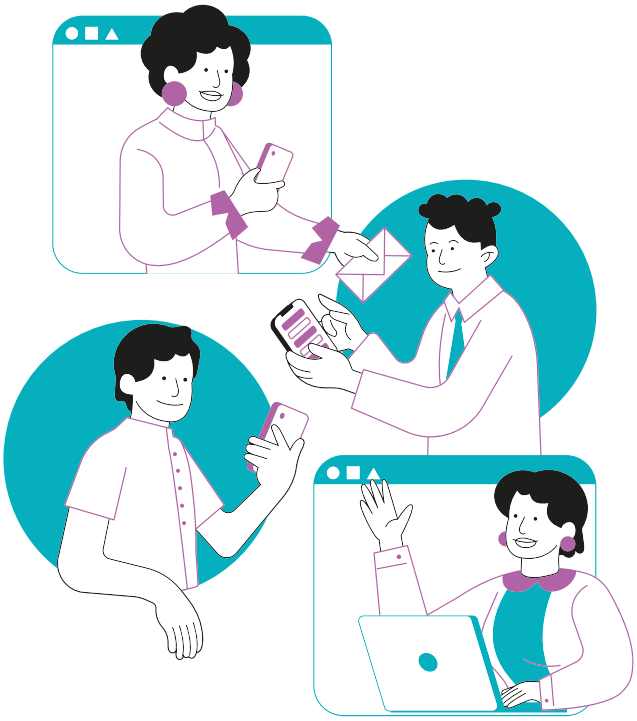
SWENext Publications Work Group
Vidhya Thiyagarajan (WG Lead), Emily Tacopina, Coleste Huggins, Heather Sheridan, Michelle Stark

SWENext New Benefits Work Group

The **SWENext New Benefits Work Group** highlights valuable opportunities to SWENexters and develops guides for enabling these opportunities. Some of this fiscal year's initiatives are listed below:

- Updating a high school internship guide
- Outlining a program for high schoolers to develop scientific communication skills for dissemination in social media
- Identifying and training guest speakers
- Developing a "job shadow" process for SWENexters/high-school students based on a pilot program at Synopsys, and publishing these guidelines for other SWE professional members to use



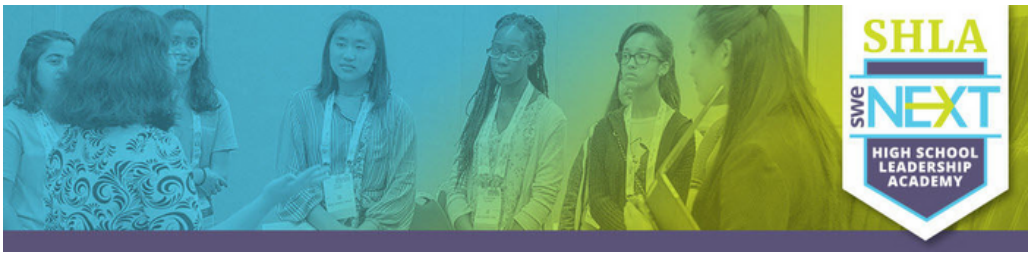


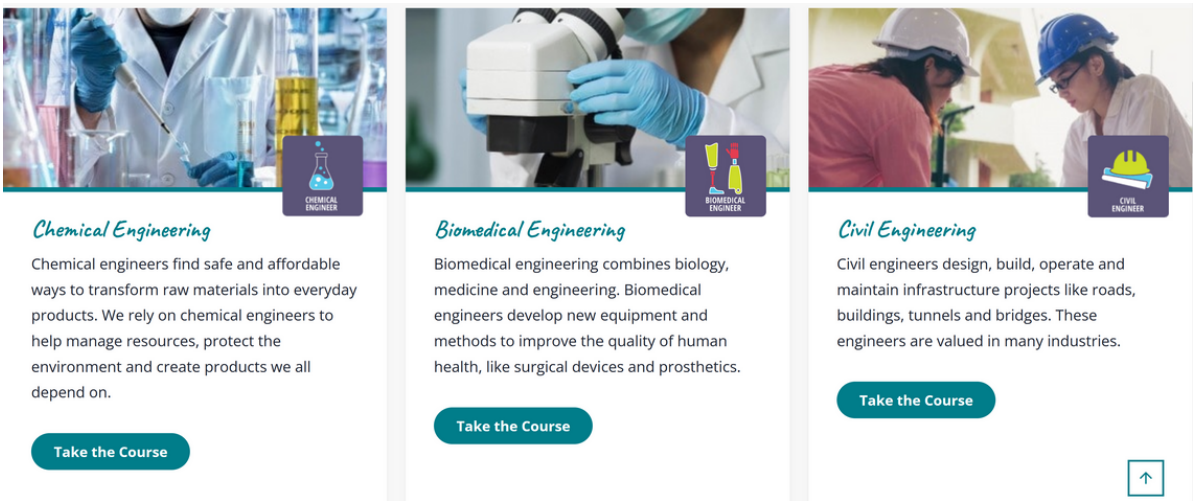
SWENext New Benefits Work Group
Victoria Lee (WG Lead), Gisella Lamas, Geetha Arun

SWENext Programming Work Group

The **SWENext Programming Work Group** strives to create programming and resources that inspire SWENexters to pursue engineering and prepare them for the journey. In FY23, the Work Group supported 11 SWENext High School Leadership Academy (SHLA) sessions and 4 SHLA Meetup sessions. They coached the SWENext Influencers who ran the SHLA Meetups, and they recruited and trained mentors for an SHLA session on College Readiness.

The Work Group also reviewed and gave feedback on seven STEM Pathway courses created by SWE HQ. There are now 15 courses in the STEM Pathways Digital Library for students to explore different engineering disciplines. Each course will have a hands-on activity geared at middle school students that the Work Group is finalizing.





SWENext Programming Work Group
Mary Zeis (WG Lead), Lachelle Conway, Natalie Zachariah, Tuyet-Hanh Schnell, Markita Riley

SWENext Awards Work Group

The Society of Women Engineers strives to recognize the successes of SWENext students and SWENext Clubs that do exceptional work in developing a community for students to explore engineering and other STEM fields. The **SWENext Awards Work Group** manages the awards process to identify and develop "the catalysts for change" who will imagine a better world for us. The team develops the award prompts, identifies and trains volunteer judges, and makes the final award recipient decisions. Through these activities, this Work Group helps empower, engage, and expand opportunities for girls to design the future.

These exceptional future engineers and computer scientists were honored for their pursuits of engineering projects, their understanding of engineering principles, their roles in inspiring young girls to pursue engineering, and their contributions to the communities they live in.

Congratulations to the SWENexters who received a 2023 SWENext WE Local Award! The categories were the Local Innovator Award and STEM In Action Award.

Congratulations to the SWENexters and SWENext Clubs who received a 2022 SWENext Annual Award! The categories that were honored were SWENext Global Innovator Award, SWENext Community Award, and SWENext Clubs Best Practices Award.

SWENext Awards Work Group
Thank you to those members who participated in the work group for the FY23 year.
[names not listed]

SWENext Recruitment Resources Work Group

The **SWENext Recruitment Resources and Strategies Work Group** brainstorms new ways to encourage students to sign up for the SWENext program, keeps recruitment material up to date, and coordinates the Annual SWENext Recruitment Challenge.

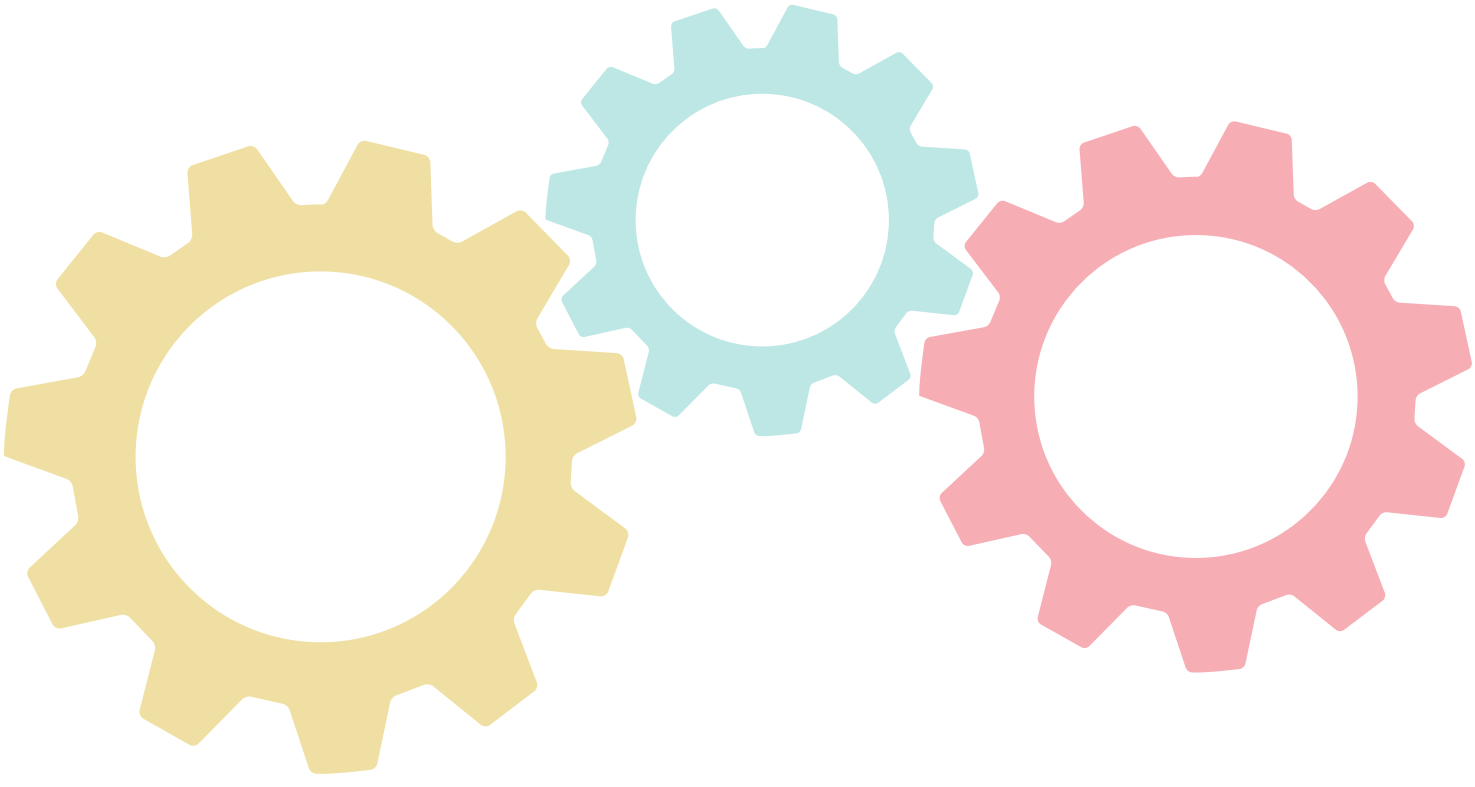
With only 13% of engineers being women, we see increasing female participation in engineering as a critical need. We believe in our mission of serving SWENexters by establishing a rich community experience, encouraging STEAM identity, and providing leadership training and college preparation. More SWENexters means a richer community experience now, and more women engineers in the future.

The SWENext Recruitment Challenge is open to SWE collegiate and professional sections, Members-at-Large (MALs), SWE Affiliates, SWE Affinity Groups, and SWENext Clubs. Each participant group creates a unique "event code" throughout the challenge to determine how many new SWENexters that group has recruited to SWENext.

SWENext Recruitment Resources Work Group

Kristin Abele (WG Lead), Karina Cuadrado, Aabosede Adewole, Samalie Ssegimu, Denise Athaide

Outreach Highlights & Resources



A Brief Intro to SWENext

Many SWEsters remember the moment they discovered STEM and decided to passionately pursue this as a future career. Some may have attended a workshop at school, knew an engineer or STEM professional in their own lives, or were reached through a STEM outreach program. SWENext provides the opportunity for SWE to influence the lives of young girls much earlier than many others experienced.

What is SWENext?

SWENext is a free program designed for students through the age of 18 to engage in the SWE community. Participants have the opportunity to get access to STEM programs, mentors, and resources to help develop leadership skills and self-confidence in their pursuit of STEM. The program focuses on girls, but all students are welcome to join.

SWENext's mission strives to:

- Empower students to prepare for careers in engineering and technology.
- Provide programming for students to develop leadership skills and self-confidence to succeed in careers in engineering and technology.
- Expand the image of the engineering and technology professions as a positive force in improving the quality of life.
- Provide programming to empower students to become advocates for peers and younger girls.
- Demonstrate the value of diversity, equity, and inclusion.
- Provide opportunities to learn and network with peers, role models, and engineering professionals.

The benefits of SWENext include scholarship information, awards, at-home engineering activities, SWENext Club resources, mentoring, events, cool projects, contests, and SWE goodies.

A Brief Intro to SWENext

Who Can Join SWENext?

- Students ages 13-18 can join anytime.
- Students under 13 require a parent or guardian's contact to join.
- Families, educators, and SWE members can join the SWENext mailing list to get more information.
- It is free to join!!

SWENext Statistics

Currently 345 clubs participate around the world.
84% of students are high school age
10% of students are middle school age
6% of students are elementary school age

How Can I Get Involved? -- Adult Advocates/Counselors

SWENext Clubs are required to have an active SWE member (either a Professional, Collegiate, or K-12 Educator member) as a SWENext Counselor. Though not required, clubs are encouraged to also have a Club Advisor (e.g. K-12 Educator, Boy and Girls Club Counselor, etc). The Club Advisor is encouraged to become a SWE K-12 Educator member. Registering the club under the Club Advisor gives sponsoring SWE sections and affiliates the flexibility to change Club Counselors without needing the SWENext section and affiliates to change their registered SWE member.

A Brief Intro to SWENext

How Can I Get Involved? -- Students

To find SWENext clubs near you, visit this link: SWENext Clubs - Society of Women Engineers

To start a new club, follow these steps:

- Find a SWENext Club Counselor and Advisor
- Get your club approved by your school or organization
- Register your club on the official SWE website
- Have each club member join SWENext
- Form club goals
- Build your leadership team
- Host your first meeting
- Have fun!

The direction of your club is up to you! Below are a few common things clubs do:

- Work on projects that use engineering to help people in your community
- Compete in SWENext Club Challenges, Future City Competition, or FIRST Robotics.
- Gain leadership experience
- Host outreach events for younger students in your community
- Attend outreach events hosted by SWE sections in your area
- Explore career and college options

Resources

- SWENext - Society of Women Engineers
- SWENext Clubs - Society of Women Engineers
- SWENext - Resources
- SWENext Club 101 Guide For Students
- SWENext Club 101 Guide For Adult Advocates

Workplace Giving

It estimated that nearly 65% of Fortune 500 companies offered **matching gift programs** in 2019. This would involve about 26 million employees for a dollar range between $2-3 billion in the United States alone. Interested in participating in a matching gift program with your employer? Read on to learn some key information about these programs.

The best resource for workplace matching and giving is the **Human Resources Department** at your company. Here are some questions you can ask to get started:

1. Does our company match employee donations to charitable or non-profit organizations?
2. Does our company value a particular donation type (money, time, community outreach, STEM activities, etc.)?
3. Is there paid time off to volunteer?
4. Is there a corporate dollar-for-time volunteer program?
5. Is there a dollar-for-dollar volunteer service grant/process?
6. Do we make available in-kind giving? What are the parameters, services, and/or products?
7. Is there a key-match amount?

Mini Glossary

Matching gifts: when a company matches donations of time or money made by an employee to a non-profit or charitable organization

In-kind giving: non-monetary donations, such as goods, time, and services

Workplace Giving

A Few Key Things to Know

Many corporations have a grid that includes three key elements, shown below.

Match Ratio (Range)	Maximum Matching Amount	Corporation has automatic submission process for employees
1:1	Time/Dollars	Yes/No
2:1	Time/Dollars	Yes/No

It is also important to know about minimums, maximums, and ratios.

1. *Low minimums*: The lower the minimum donation amount for gift requests, the more accessible the program is to employee donors of all levels. This is done to ensure that companies are matching gifts to the organizations their employees value or about which the employees have passion.
2. *High maximums*: Offering high maximums tends to lead to increased participation among employees and optional benefits for non-profits, companies, and donors.
3. *Large ratios*: This metric is used to determine the amount of match funding a donor has the ability to request from their employer. This multiplies the impact of the original donation. One-to-one is the standard match.

Selected Corporations with Matching Programs

Microsoft, Alphabet, Pfizer, Boston Scientific, Sanofi, TR, Deloitte, Boeing, General Electric, Gap Corporation, AT&T, Exxon Mobil, CarMax, Johnson & Johnson, Choice Hotels, Bristol-Myers Squibb, Coca-Cola, IBM, Avon, American Express, FM Global

Technology Outreach for Lifelong Learners

Written by: Jacquelynne Hernández, Meagan Olsen, Elizabeth Gjini

Technology is age agnostic. Those who use various high or low technologies, personal electronic devices, and communications applications vary from the pediatric to the geriatric. In a past issue of Celebrate SWE Outreach, we explored the technology gap in low-income areas and how it was exaggerated by the pandemic. Indeed, technology can be a gap or a bridge. This article is special as it addresses how to create bridges. It highlights how outreach touches the lives of lifelong learners regardless of circumstances. The learners include teachers, secondary school students, and senior citizens.

In the post-pandemic world, technology has become more important at schools. Even at low-income schools, many classrooms require the use of technology, like smart boards and digital platforms. This has created an abundance of resources for teachers to use and aid students in their learning. For example, a teacher from Paterson, New Jersey stated many students have learned to use technology to communicate with peers and teachers. (EdTech) According to the US Department of Education, in 2018 nearly 7 million students (14% of all students) received special education. Our teacher from Paterson noted that technology has been used in a variety of ways including audiovisual assistance for those with visual impairments and speech-to-text software for students with speech impediments. Another way the digital age has helped school districts is with the ratio of students to teachers. With a lack of teachers, these digital platforms have allowed teachers to be hired from other states and teach completely online when students have opted to be home. These digital platforms have helped bridge this gap in some ways as educators are able to occupy some students with self-paced learning videos, while helping others more hands-on. School districts have come a long way and as the world goes back to normal, they will continue to adapt to use technology as a complimentary aid rather than an all encompassing teaching tool.

Technology Outreach for Lifelong Learners

In this article, the term "secondary students" refers to learners in grades 6-12. This is the demographic who was likely at the tail end of the third grade or just finishing their first year of high school algebra when the COVID-19 pandemic protocol required remote learning environments. These students had to negotiate learning fractions, the manipulation of multiplication tables, or first-year algebra from a laptop or other device in the home. Not all was doom and gloom, though. Chang (2022) reports that grades were positively associated with mandated attendance for synchronous and asynchronous learning options. Some schools have adopted the online option for flexibility; students absent from the classroom can use virtual options like Canvas to keep up with their daily work. Though frustrated with the learning curve for how to set up stations from home, Sonnenschein et al (2021) describe the positive involvement and active engagement of parents in daily school work. Lastly, the creation of a new normal (Khirwadkar et al, 2020) means that students who struggled due to the fast pace of face-to-face instructions gained an opportunity to explore and reimagine math and science topics with the aid of technical support and time to invest in learning.

The COVID-19 pandemic also caused a significant increase in technology use among senior citizens, who turned to digital solutions for everything from video chatting to ordering groceries. (AARP) Over 55% of surveyed adults over 65 years old reported that they "used technology differently to connect with others" as a result of pandemic isolation. (Haase, et al. 2021) Another study reports that over 80% of surveyed senior citizens increased their use of technology. (Murciano-Hueso, et al. 2022) Despite this increased engagement with technology, a significant divide remains between older adults able to access and use technology solutions and those who cannot. Fifty-four percent of adults over 50 in the U.S. want to learn more about technology, but opportunities to do so can be challenging to find, particularly in low-resource areas. (AARP) High costs associated with digital devices and internet services, as well as a lack of accessible technologies for individuals with physical impairments (e.g., low vision,

Technology Outreach for Lifelong Learners

limited motor capabilities), prevent greater uptake as well. There are a multitude of untapped outreach opportunities associated with improving technology literacy among senior citizens, and a clear interest and need for these opportunities.

With so many ways to use technology, it is wise to be creative. As mentioned before, there is still a gap in the availability of technology and digital solutions for much of the population and it is imperative to look for ways to bring these solutions to new places. In just a few paragraphs, plenty of examples were given: technology is being used for communicating with students with disabilities, connecting senior citizens to better care options, and giving secondary students alternative ways of learning. As engineers and STEM educators, the members of SWE must continue to use technology not only in formal settings, but in our volunteer opportunities. The world has changed to rely on digitization more and more; outreach will be no different.

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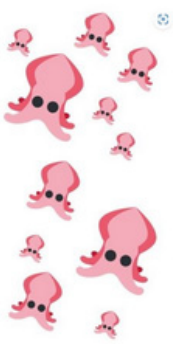
Skype a Scientist

Section: Member-at-Large (MAL)
Event: Skype a Scientist

If volunteering for K-12 outreach in person is not an option right now, there are many ways to get involved virtually. Member at Large Kayra has volunteered for *Skype a Scientist* since the start of the COVID-19 pandemic. *Skype a Scientist's* mission is to make science accessible and fun through personal connections with scientists. The group has a database of thousands of scientists and the organization helps these scientists connect with classrooms, families, libraries, scout troops, and more all over the globe. The goal is to give students the opportunity to get to know real scientists and get the answers to their questions straight from the source. This service is free for teachers to request.

As her schedule allows, Kayra will volunteer for 30-40 minute long chats with classrooms. After getting in touch with the teacher, she will cover topics that are of interest to the attendees. The students have great questions and are very curious to learn about different professions. This is especially apparent in elementary-aged kids, who are always so excited and very interactive. As Kayra told us, "it always helps me to feel excited again about my career when I see how excited the kids are to learn about it. "

If you want more information about volunteering with *Skype a Scientist*, visit their website or get involved. You can also read their 2022 Annual Report.



Googly Eyes, Lava, & STEM

Section: Rensselaer Polytechnic Institute SWE
Event: Black Families Technology Awareness Day

The Rensselaer Polytechnic Institute (RPI) SWE outreach section used their creativity to devise an outreach event that would appeal to many participants of various ages and skill sets. RPI SWE hosted a one-day workshop for Black Families Technology Awareness Day in February 2023, where eight volunteers led an activity called "The Floor is Lava."

The event reached about 120 girls and boys in elementary school and an additional 100 adults. Each student was given a strip of orange streamer taped across their desks (the lava) and a piece of red fluff with googly eyes (the object the students needed to get across the lava). In the workshop, the volunteers shared a presentation which gave the students some ideas of simple systems that could help them get the fluff objects across, including pulleys, cantilever beams, wheel and axles, etc. Then, the students were given some crafting supplies, such as popsicle sticks, cups, strings, and rubber bands, to create a way to get across the lava.

The RPI SWE outreach team met weekly to plan this event using the outreach budget. A challenge they faced was figuring out an activity that would appeal to and be suitable for a range of ages (5-11 years old). Volunteers had fun working with the students on this activity and enjoyed seeing how far out-of-the-box younger students can think when there are no specific instructions or kits they have to follow.

Incorporating Indigenous Culture

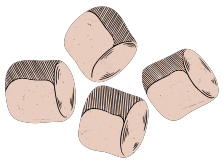
Section: Utah State University SWE
Event: Incorporating Indigenous Culture into Engineering

In March of 2023, the Utah State University (USU) SWE section hosted a state-wide outreach event, bringing multi-day STEM outreach activities to Montezuma Creek, Bluff, and Mount Pleasant, Utah, USA. In partnership with Central Utah Educational Services, North Sanpete School District, and San Juan School District, USU SWE was able to reach over 650 girls and boys of elementary school age and 20 adults.

In Montezuma Creek and Bluff, Utah of San Juan Country, the outreach event focused on incorporating traditional indigenous Diné knowledge into activities that related to the four undergraduate engineering departments at USU. One of the activities was an alcohol extraction of pigments present in either spinach or broccoli. The students were able to choose which plant they wanted to use. This was connected to the Diné (Navajo) knowledge by going over the different traditional uses for plants from southern Utah. The activity also involved asking the students to share how they see their family or friends use different plants in their lives and correlated this to how Biological engineers use plants and different methods of extraction to utilize the phytochemicals present in different plants.

The students also built Hogans, a traditional religious structure in Diné culture, out of toothpicks and marshmallows. They then tested their structure against a Jello “earthquake” and made improvements as desired. Other activities included creating Paper Circuit cards of the Navajo Nation flag to learn about circuits, and making paper pinwheels to learn about renewable energy efforts of different companies and Diné engineers.




Incorporating Indigenous Culture

In addition to immersing students into STEM activities, the volunteers were greatly impacted as well. Volunteers learned how much Indigenous knowledge can shape engineering and gained a greater appreciation of how the knowledge that Native American tribes have passed down for generations is still used in their daily lives. A USU outreach member said, "It broadened what the definition of DE&I is for me. Not only do we need a diverse engineering world, but we need a diverse engineering world that includes the cultures and traditions of everyone involved."

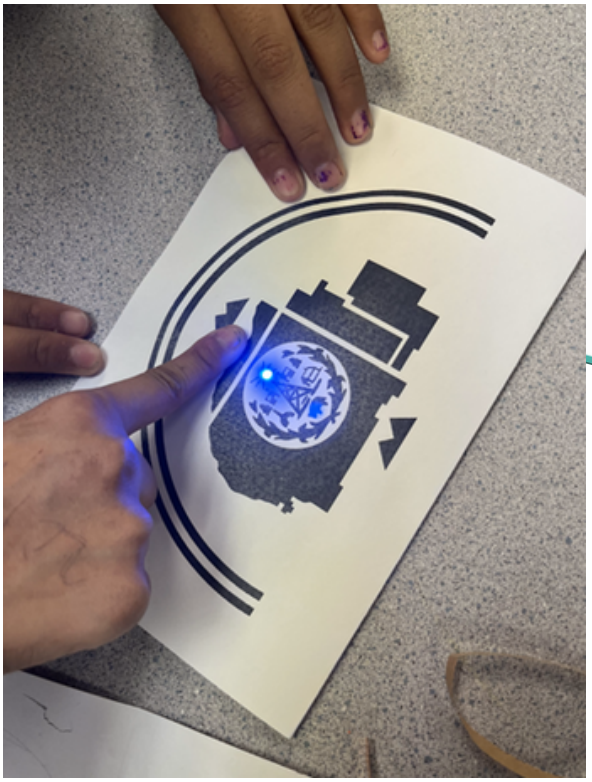
In Mount Pleasant, Utah in Sanpete County, USU SWE focused on some of the basic aspects of Biological, Electrical and Computer, Mechanical and Aerospace, and Civil and Environmental Engineering. Some of the activities included utilizing Miracle Berry tablets to teach students about how proteins can change based on their environment. The students had half of a miracle berry tablet, and then they tried different fruits to see how it affected them. Students also used binary code to make bracelets of their initials using different colored beads, learned about mechanical engineering by building mini catapults from popsicle sticks and rubber bands, and studied structural engineering by building structures out of toothpicks and marshmallows. Additionally, North Sanpete School district provided an activity that combined art and engineering together where students painted using Sphero robots and butcher paper, and Central Utah Educational Services (CUES) brought their mobile planetarium for the students to explore.

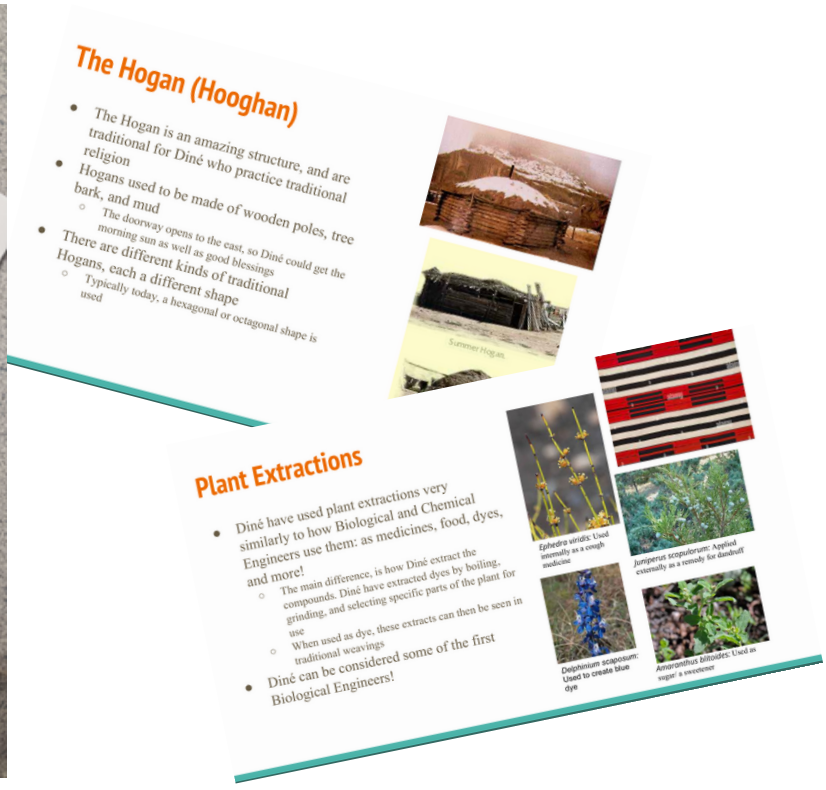
For such a massive outreach effort, USU SWE Outreach went through an intensive planning process over almost three months that was sponsored by an outreach grant from the Hill Air Force Base. This involved interfacing with the teachers and district representatives in each school district to coordinate schedules and activities. The USU SWE outreach committee helped plan the different activities, and found a connection with a Diné engineer to incorporate Traditional Ecological Knowledge of the Diné people into the event.

Incorporating Indigenous Culture

USU SWE was able to reach a large group of students in different geographic locations through this outreach effort. They were also able to combine STEM with culture, which helped the students feel more connected to the science and engineering they were studying. Representation was included in the presentations and activities as well, where students were introduced to engineers who come from a similar background. USU SWE believes that representation is everything, and if outreach events are targeted to an underrepresented group, showing students that others just like them have pursued and succeeded in STEM fields can increase the impact of the event.

Beyond this event, USU SWE is also in the process of creating a children's book featuring Diné engineers, their stories, projects they have worked on, and how they have kept their culture present in their professional lives! Copies of this book are planned to be given to every student at the schools in San Juan County that the section interacted with, as well as the engineers that gave permission to be featured in the book.





Inspiring the Next Generation

Section: San Diego Professional SWE
Event: Girls in STEM Inspiration Day

The San Diego Professional SWE Section hosted a one-day event, the Girls in STEM Inspiration (GIS) Day 2023, on April 15. The event included workshops, presentations, and mentoring for the participants, which added up to 85 students of elementary, middle, and high school age, five adults, and 38 volunteers (Collegiate and Professional). The theme of the event was "Dare to Dream," and it was a day of inspiration for underrepresented (girls) and under-served youths to be encouraged and inspired to pursue STEM as a career choice. Attendees heard a presentation of role models in the Performing Art Center, met with engineers to have an intimate conversation in a speed-mentoring session, and worked on a hands-on engineering activity with testing and re-iteration.

The event was organized by Dr. Tracy Nguyen, the SWE San Diego Outreach Director, along with the GIS Day Committee (Dr. Mary Isaac, Phet Pease, Mirella Cruz (SWE-SD Outreach Co-Chair)). To plan for such a large event, the venue was the first priority and was secured in the fall. Funding was provided by the SWE PDG, Discover.org 2023 Bell Girl Day Grant, and Quartus Engineering.

SWE San Diego's goals for the event were to increase the number of attendees from the GIS 2019 event (the last time the conference was in person), ensure students had exposure to a variety of different facets in the STEM ecosystem, and lastly make the event fun and engaging.

Inspiring the Next Generation

In total, the event reached 85 students, with 85% of them identifying as female, and the youngest student was in third grade. Volunteers were instrumental in the success of the event; survey results showed that 99.5% of students would recommend this event to a friend. Survey results allowed the students to express thoughts about improving the event, and some offered that they would like more time to meet engineers in the speed mentoring, and others wanted more hands-on projects. The best quote of the day was from a 5th grade girl, "This is the BEST Place ever!"

Some other comments from students when asked "What did you like most about today's program and why?" include:

- “I liked the speeches from the women in STEM and in school preparing to become in STEM. I liked seeing all the diverse stories of the women. It was very inspiring!”
- “I loved how it encouraged girls to do what they dream of and they are so much more than most people think! I loved learning about people’s stories and being able to build something with my friends!”
- “Working together with my partner was nice. I am an introvert and this was an amazing opportunity to collaborate with someone who has similar interests as me.”
- “I liked getting my hands dirty (building the cars).”
- “I really loved learning about the speakers and their journey to the current place they are at with their careers.”

Even volunteers got a lot out of the event. Volunteers were inspired by the generosity of all the volunteers donating their time, and were invigorated by the impact on under-served and underrepresented youths. Among the numerous accounts shared by volunteers and students, one encounter particularly stood out and touched the heart of one of the volunteers. It involved a young high school girl who expressed how the event had been incredibly enlightening and educational for her, providing a much-needed break from her daily routine.

Inspiring the Next Generation

She opened up about her family and expressed her intention to explore engineering clubs at her school. She excitedly spoke about sharing her race car project and mentoring session with her mother and even took some food home for her family! This resonated deeply with our volunteer, as it reminded her of her own transformative experience participating in a SWE event during her high school years. This conversation led to our volunteer sharing information about SWENext and how the young girl could become involved. This powerful anecdote exemplifies the significant impact events like Girls in STEM Inspiration Day have on communities like City Heights, where access to STEM role models and exposure is often limited.

Overall, SWE-SD achieved a record-breaking outreach fiscal year with over 60 outreaches led by Dr. Tracy Nguyen. Notably, their hallmark event, Girls in STEM Inspiration Day, received recognition as the Outstanding Outreach Event at WE Local Seattle. They successfully launched the "Meet-up with Engineers" initiative, enabling intimate monthly conversations between SWENexters and engineers. Additionally, they conducted five tours, visiting four facilities and San Diego State University. Looking ahead, they will celebrate International Engineering Day 2023 at the San Diego Air & Space Museum featuring a panel discussion with engineers from Quality Engineer Justina Sanchez's book, "Extraordinary Engineers: Female Engineers of This Day and Time." Moreover, their efforts resulted in surpassing their goal of expanding SWENext Clubs in San Diego, with almost 30 clubs established.

Invisible Ink

Section: Northwestern University GradSWE
Event: 5th Ward STEM Fest

On April 29, 2023, Northwestern University GradSWE participated in the 5th Ward STEM Fest, a one day event where local STEM organizations host a demo booth or an activity session for K-5 students. STEM Fest is also centered around celebrating underrepresented youth engaging in fun and challenging explorations in a festive atmosphere. The goal is to engage and excite families as they learn about STEM programs, courses, and careers.

For the GradSWE STEM booth, the activity chosen was an "invisible ink" demonstration, led by three SWE volunteers. Students would draw an invisible pattern using a slurry of baking soda and water, then the pattern would be revealed by drawing with grape juice over the design. The intent of the activity was to introduce students to the concept of pH and acid and base reactions. GradSWE was able to reach 20 girls, 20 boys, and 10 adults through this activity.

In preparation for the event, the GradSWE Outreach team brainstormed for appropriate STEM booth demo ideas in March. This was a challenge to find an appropriate STEM booth activity. They wanted an activity based on a simple physics or chemistry concept, but it also had to be eye-catching, engaging, safe, and hopefully leave the students with a souvenir they could take home. After scouring the internet for ideas and discussing them in-depth, the "invisible ink" demo was the idea that was selected. After determining the activity, the team sent in the application for the STEM booth to the organizers in April and got accepted in the middle of the month. Then GradSWE had to find volunteers and start preparing for the materials needed in the demonstration. The GradSWE booth is fully funded by the club funding from Northwestern University.

Invisible Ink

A GradSWE volunteer shared that as a graduate student, they are constantly approaching science in a very serious and analytical mindset. At the event, volunteers were approached by children who were genuinely excited by the demo because it looked cool and interesting. Even though they may not understand the science behind the demo, they were not deterred from the activity and would keep thinking of new hypotheses. Volunteers were reminded that it is normal to struggle with understanding science, but it is also important to not give up the drive to form possible hypotheses. Volunteers also shared a best practice, and encouraged others to allow the students formulate their own theories and actively engage them to think about what is happening in the demonstration. Adults may be tempted to give students a "correct" answer or the theory behind an activity, but it is important to give the students space to explore on their own.

Coding Without a Computer

Section: Lockheed Martin
Event: Learning to Code

As a founding member of Corporate Partnership Council, Lockheed Martin seeks to connect SWE members across the corporation through the Lockheed Martin SWE (LM SWE) organization. One of their goals is to further SWE's outreach and help increase the pipeline of talent in STEM.

In celebration of Introduce a Girl to Engineering Day and Engineers Week, LM SWE hosted the second annual virtual learning to code event for children of Lockheed Martin employees. This year's event occurred on Tuesday, February 21st via Zoom. Approximately 30 participants explored engineering through an interactive coding without a computer activity. They learned the fundamentals of coding and programmed a robot to build a habitat efficiently. This was accomplished using plastic cups and predefined visual programming vocabulary. Participants engaged with 7 volunteers from different Lockheed Martin locations and worked through exercises to practice the concepts as well as learning about engineering career opportunities at Lockheed Martin.

The event was a success with the following feedback from one of the parents: "Great job today! I brought my daughter … to the event and she loved it! The concepts reminded her of the Osmo coding kit that she plays with every now and then. Thank you!"

LOCKHEED MARTIN