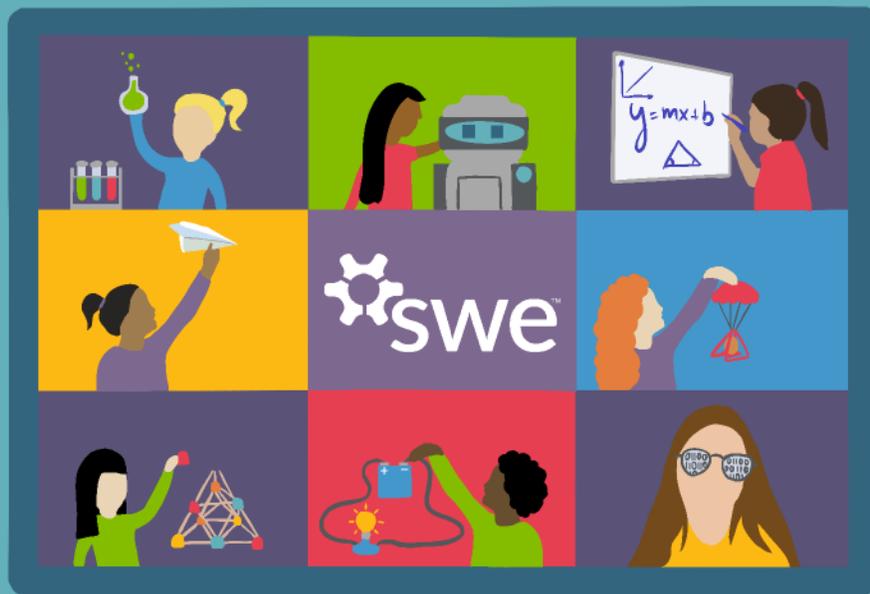


# CELEBRATE SWE OUTREACH



FY21



Highlighting Efforts from the SWE Outreach Committee, SWENext  
Committee, Sections, and Affiliates

# Celebrate SWE Outreach A Year in Review: FY21

## Letter from the Editor

Welcome to the FY21 issue of Celebrate SWE Outreach: A Year In Review. This publication is written, formatted, and edited by Outreach Committee volunteers and I cannot be prouder of the work they have accomplished. As volunteers, we all understand the amount of time outside our everyday lives that gets put into planning outreach events, participating in SWE activities, and helping other group members. With that said, I would like to thank Monica Challenger and Hilary Fiorentino for the amazing work they have done here. Each has brought perspective and insight to the table that we are excited to share with you. I would also like to thank Sahara Becker for being a great Publications work group lead. She has continually guided us in the right direction since the creation of this publication. It has been a pleasure and an honor working with these women. This group has challenged me to think about the influence we have as outreach practitioners. I hope that by reading this publication, you will see the thought that went into each page.

I am especially proud of the article titled: *COVID-19 and the Technology Gap in Our Communities and Classrooms*. As a group we interviewed K-12 teachers across the US to understand the impacts of COVID-19 on low-income students. We specifically explored the transition to technology-based learning and we have found that the technology gap that has existed in our school systems was only exaggerated during the pandemic. As SWE members, I urge you to read the article on page 16 and reflect on the ways we can be more inclusive in our outreach.

Throughout the publication you will also find section highlights, SWENext information, outreach award winners, and various resources for you to explore. Our members found new ways to reach students through virtual outreach programming that we hope you will take advantage of. As many of us know, progress towards a diverse workplace cannot slow down, even when the world does.

Please use the content to help inspire your next K-12 outreach events and do not forget to enter your events into the [Outreach Metric Tool \(OMT\)](#).

After reading through the publication, please take the time to fill out our [feedback form](#) so we can continue improving our content.

Thank you for all your outreach efforts this year! It has been wonderful to see so many SWE members adapting to the changing world and continuing participating in STEM outreach. Here's to another year of fun and innovative programming!

Elizabeth Gjini  
SWE Outreach Committee  
Celebrate SWE Outreach! Publication Lead

### Publications work group Celebrate SWE Outreach Members

Sahara Becker      Hilary Fiorentino  
Monica Challenger      Elizabeth Gjini



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Special thanks to our SWE  
HQ and Leadership Team



Outreach and Student  
Programs Coordinator:  
Markita Riley



Director of Content and  
Programs:  
Valerie Bland



Director of Advocacy:  
Kerri Greenfelder

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# Meet the Outreach Committee

## Leadership

The Society Outreach Committee's mission is to empower adult advocates - SWE members, parents, educator, and others - to introduce girls to engineering, cultivate a STEM identity and bring those students into SWENext. During FY21, over 50 committee members from across the world volunteered on the Publications, Global Outreach, Training & Development, and Resources work groups. Our incredible committee members produced 12 Adult Advocate Newsletters, 12 Adult Advocates Avenue All Together blog posts, hosted and published 4 webinars, produced over 5 digital resources for outreach practitioners, represented SWE at the Girl Scouts USA STEM Expo, and more!



**FY21 Chair:**  
Katelyn Lichte



**FY21 Chair-Elect:**  
Haley Antoine

# Meet the Outreach Committee

## Publications Work Group

The SWE Outreach Publications Work group is responsible for generating monthly newsletters and blogs and managing our social media pages for educators and adult advocates. Additionally, the Publications Work group creates the annual Celebrate SWE Outreach publication that summarizes the achievements the society has made toward inspiring the next generation of engineers. The publications are targeted toward parents, educators, outreach practitioners, school guidance counselors, and any adult who aims to advocate for girls interested in STEM and our subscribers are worldwide. In our FY21 publications, we covered topics such as [how to conduct a virtual outreach event](#), [teaching kids to be champions against bias](#), and [embracing failure](#).

If you haven't already, be sure to subscribe to our newsletters to stay up to date with outreach news and to be equipped with all the tools you need to be a great advocate.



**Work Group Lead:**  
Sahara Becker



**Blogs:** Catherine Gurecky (Lead), Kristina Phillips



**Newsletters:** Victoria Smerdon (Lead), Debra Kimberling, Mariel Kolker, Vanessa Li



**Celebrate SWE Outreach:** Elizabeth Gjini (Lead), Monica Challenger, Hilary Fiorentino  
**Publication Distribution and Social Media:** Blair Korman

# Meet the Outreach Committee

## Training and Development Work Group

The FY21 SWE Outreach Training and Development work group was responsible for providing high-quality training for adult advocates that enable and empower them to perform outreach in their communities. This work group was comprised of four focus areas, each with their own goals.

The New Benefits Focus Areas was responsible for surveying SWE members to determine awareness of outreach committee resources and determine new resources members would like to see.

The Introducing Engineering Concepts Focus Area was responsible for creating and releasing the [Kickstarting STEM Interest Among Elementary Level Girls](#) training which covered how to introduce STEM topics to elementary school girls.

The Role Models Matter Focus Area was responsible for releasing training modules on how to be a good role model, which will be used to train volunteers for SWE signature events. The modules released in FY21 were [Role Models Matter 101](#), [Engaging Girls in STEM](#), and [Bias Literacy 101](#).

The Working with Underserved Youth Focus Area was responsible for creating and releasing the [Effectively Engaging Underserved Youth in STEM](#) training which covers how to get started working with underserved youth as well as some general tips and tricks for success.



**Work Group Lead:**  
Samantha Balistreri



**New Benefits:** Elizabeth Heyde • **Introducing Engineering Concepts:** Swetha Vinjimoor (Lead), Andrea Anger, Diana Berry



**Introducing Engineering Concepts (cont.):** Paulina Eberts, Winifred Ereyi, Jamie Hamilton, Abigail Mitchell, Lindsey Waggoner



**Role Models Matter:** Lori Kahn (Lead), Elizabeth Brooks, Mary Isaac (SME), Celia Kornegay  
**Working with Underserved Youth:** Ruby Granillo

# Meet the Outreach Committee

## Resources Work Group

The SWE Outreach Resources work group is made up of three focus groups: Assessment and Metrics/Outreach Tools, SWE Strategic Partners, and WOW! Innovations Challenge. The work group has a wide range of responsibilities throughout the fiscal year including managing and updating the Outreach Metric Tool, understanding and strengthening SWE's relationships with partners, and coordinating the WOW Innovations Challenge. Assessment and Metrics worked with HQ to create a new version of the Outreach Metric Tool. They also created a few flyers that summarize the statistics of SWE Outreach events over the years. Outreach Tools created pamphlets with information to assist the society members with navigating outreach during the pandemic. These can be found on the SWE website. SWE Strategic partners assisted Girl Scouts with identifying local SWE chapters to each local Troop, and hosted a booth at their annual conference! The Resources work group continued to be successful during the pandemic and it was a testament to the amazing volunteers.



**Work Group Lead:** Sydney Robinson



**SWE Strategic Partners:** Jessica Sorick, Tracy Goldman, Caroline Wakunski



**Assessment and Metrics and Outreach Tools:** Corrinne Givens (Lead), Sara Wheeland, Ruth Williams, Auburn Mattingly (not pictured)



**WOW Innovations Challenge:** Lucy Kurtz (Lead), Erika Yegerlehner, Marisa Ceppi (not pictured) • **Student Programs Representatives:** Annie Ding, Julia Hines



# Meet the Outreach Committee

## Global Outreach Work Group

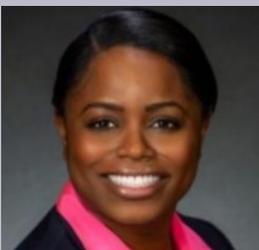
The mission of the Outreach Committee Global Work group is to expand SWE's global reach for outreach and determine strategy for how the outreach committee interacts with other countries. Some key highlights of their work in FY21 include running a Global Outreach networking hour at WE Local Bengaluru in April 2021 and hosting two webinars on global affiliate formation and corporate sponsorship guidelines.



**Work Group Lead:**  
Mary Isaac



**India Group:** Sowmya Nagesh, Gauri Kulkarni, [Megha Poovaiah Thurira, Smita Kharkate, Paul Robichaud] (not pictured)



**Nigeria Group:** Charity Asuquo Ikpe, Peace Ikpotokin • **Jakarta:** Jane Nawilis, Davida Gondohusodo (not pictured)



**Global Outreach:** Tracy Nguyen, Allison Goodman, Inga Urbina, Maryam Saif (not pictured)



# Meet the SWENext Committee

## Leadership

The SWENext Committee's mission is to expand and implement resources to support SWE's pre-collegiate programs, with a focus on establishing a rich community experience locally and Society-wide. The SWENext Committee is composed of seven work groups: Publications, Awards, SWENext Clubs, New Benefits, Recruitment Resources & Strategies, Transitions, and Programming. In FY21, the committee worked to grow SWENext membership and the number of SWENext clubs. Additionally, the committee increased virtual programming and made improvements to SWENexter experience by testing and evaluating new and existing SWENext benefits.

We concluded FY21 with 284 SWENext clubs which was a 29% increase from FY20. 49 sections/clubs/affiliates/MALs participated in our SWENext recruitment challenge, helping us increase the total number of SWENexters to 5,768. We also hosted 17 virtual events for SWENexters.



**FY21 Chair:**  
Fiona Redmond



**FY21 Chair-Elect:**  
Jill Murfin

# Meet the SWENext Committee

## Publications Work Group

The Publications Work Group connects with SWENexters through newsletters and social media to help them develop their engineering identity and give them a sense of belonging to the SWE community. They publish a K-8 and High School newsletter each month that provide activity ideas, and helpful resources. The high school newsletter contains a SWEet Wisdom column to provide answers to student's questions about college, engineering, and more. In FY21, the work group collaborated with SWE Headquarters and Marketing to revamp interactions with the SWENext social media and to improve challenges.



**Work Group Lead:**  
Michelle Scott



**HS Newsletter:**  
Madeline Dubelier



**K-8 Newsletter:**  
Allison Osmanson



**HS Technical  
Feature:** Eleonora  
Chakraborty



**HS Day in the Life:**  
Kristine Loh



**Social Media/Eng.  
Challenges:** Heather  
Sheridan



**SWEet Wisdom:**  
Aishwarya Saraswathi

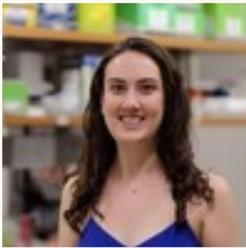


**SWE Outreach  
Incubator:** Nikltha Rao

# Meet the SWENext Committee

## Awards Work Group

The Awards Work Group recognizes and rewards outstanding SWENexters. The award categories include Global Innovator, Community Award poster competition, Clubs Challenge, Clubs Best Practices Award. This work group is responsible for defining the award categories and criteria, publishing and promoting the award packet, selecting and training judges, and overseeing the judging process. The award recipients from WE20 are featured on page 38.



**Work Group Lead:**  
Lisa Cervia



Maya Rozenshteyn



Annie O'Rourke



Coral Jean Cotterell



Suman Sabastin



Moriah Momsen



Neethu Simon



Smarita Sharma

# Meet the SWENext Committee

## New Benefits Work Group

The New Benefits Work Group began FY21 by developing and publishing a Mentoring 101 Guide to serve as a resource for SWE members who want to implement mentoring programs. A primary focus for the New Benefits work group in FY21 was to understand and evaluate year-round SWENext challenges and compare them to similar youth program challenges. They analyzed and summarized research done by other organizations like SHPE and NSBE. They also worked to define the objectives of a virtual job shadowing program, backed by research, and they created a plan to work with the Outreach Committee for FY22 to run a pilot or create a best practice guide.



**Work Group Lead:**  
Stephanie Tu



**Middle School  
Benefits:** Sara  
Morey



**Website &  
Challenges:** Atlanta  
Geleta



**Virtual Job Shadow  
Pilot:** Sarah  
Worsham



**Virtual Job Shadow  
Pilot:** Jillian  
Maling

# Meet the SWENext Committee

## Transitions Work Group

The Transitions Work Group creates content to help guide students through major transitions in their STEM pathway such as the middle school to high school and high school to college transitions. They sent out Scholarship Tips that help SWENexters apply for SWE scholarships and updated the Milestones to College documents that are sent to SWENexters every year. In FY21, they partnered with the Outreach Committee in a collaborative effort to host the Wow! Innovation Challenge. In addition they planned a webinar on non-standard engineering majors that will be hosted in the beginning of FY22.



**Work Group Lead:**  
Annie Ding



Lisa Woodward



Danielle Walters



Julia Hines



Christiana Aguirre

# Meet the SWENext Committee

## SWENext Clubs Work Group

In FY21, the SWENext Clubs work group put together a system that matches students looking to form a club with SWE members willing to volunteer as counselors. To improve a SWENext club's first year, the work group exceeded their goal of five and established seven contact time points throughout the year and one at the end of their club's first year. In addition, they created a Collegiate and Professional 101 guide to support new clubs and hosted the SWEet Creations challenge where they challenged clubs to answer the question "What new engineering field do you see emerging in the next fifty years?"



**Work Group Co-Lead:**  
Kaelee Mader



**Work Group Co-Lead:**  
Elizabeth Heyde



Gaby Vasquez



Marie Laplante



Bekah Travis



Vidhya Thiyagarajan



Laura Traczynski



Ashley Kreuder



Melissa House



Mina Ali



Anushka Pathak

# Meet the SWENext Committee

## Recruitment Resources & Strategies Work Group

The Recruitment Resources & Strategies work group leads the SWENext recruitment challenge and develops resources to help sections recruit more SWENexters. The FY21 recruitment challenge had 49 sections/clubs/affiliates/MALs participate. The Recruitment Work Group improved upon the SWENext Demographics Database and created a monthly SWENexter and Executive Dashboard which has made the number and demographics of SWENexters more accessible to sections and committee members. With the improved utility of the SWENexter dashboard, sections can gain insight into trends and demographics. The dashboard is sent out monthly to all professional sections and committee members. With the monthly dashboard, the group includes recruitment advice, updates on active recruitment challenges, and advice for sections to maintain and engage SWENexters as well as to recruit them. It also includes advice for how current SWENexters can recruit their friends.



**Work Group Co-Lead:**  
Emily Meuers



**Work Group Co-Lead:**  
Kristin Abele



Emily Meuers



Karina Cuadrado

## Programming Work Group

The Programming work group creates events (panels, social events, workshops) for SWENexters and assists SWE headquarters with their K-12 programs such as SHLA and SWENext Connect. In FY21, the Programming work group, along with SWE headquarters, ran 17 virtual sessions, exceeding the goal of 8. In one event, they partnered with the University of Michigan SWE section and piloted a virtual SWENexter meetup. They also piloted a virtual speed mentoring session with the help of the SWE Pittsburgh section.



**Work Group Co-Lead:**  
Laurie Ramsey



**Work Group Co-Lead:**  
Mary Zeis



Gisella Lamas

# Outreach Metric Tool (OMT)

## FY21 Results

The **Outreach Metric Tool (OMT)** is the best way to report your outreach events to SWE. You can enter any outreach events that directly impact K-12 students, parents, and educators, to help them explore and understand engineering disciplines and career. At the end of each fiscal year the outreach committee reports the findings to our members.



If you want the chance to be featured in next years issue of Celebrate SWE Outreach! And other SWE publications, don't forget to submit your FY22 events to the Outreach Metric Tool (OMT). All types of STEM outreach events are accepted. We love to hear how you are inspiring the future generations of STEM leaders.

[Link to OMT](#)

[Link to PDF Version](#)

[Link to FAQ's](#)

238

Outreach Events  
Reported

8

Parent & Educator  
Events

14,282  
Girls Impacted

1,541  
SWE Volunteers

# COVID-19 and the Technology Gap in Our Communities and Classrooms

By Hilary Fiorentino

In 2020, the challenges imposed by the COVID-19 pandemic fundamentally changed how people around the world navigated their everyday lives. In the US, people have faced lockdowns, school closures, and everyday activities shifting to the digital world. The murder of George Floyd that same year was a catalyst for open discussions around racism and the inequalities faced by African Americans and minority groups. While the world faced new challenges with the onset of COVID-19, in some cases, the pandemic exposed and exacerbated pre-existing inequalities. As the world shifted online, it revealed the challenges faced by low-income populations when it comes to online schooling - the COVID-19 pandemic highlighted and widened the digital divide that exists in the US.

salaries, and attend schools with fewer resources. Statistics shared by UNCF found that schools that enroll at least 90% of students of color receive \$733 less per student than schools with at least 90% of white students.<sup>(6)</sup>

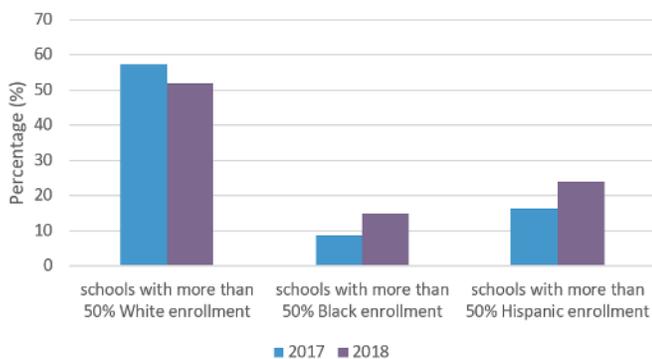


One in three African American and Hispanics did not have access to a computer at home.<sup>(5)</sup>

Even before the COVID-19 pandemic and the switch to online schooling, technology disparities existed in racial minority populations and low-income communities. One in three African Americans and Hispanics did not have access to a computer at home and 35 percent of African Americans and 29 percent of Hispanics did not have broadband. Additionally, a lack of technology infrastructure made it more difficult to reach certain areas and populations. The Federal Communications Commission cited in 2017 that more than 26 percent of rural residents did not have access to fixed broadband.<sup>(5)</sup>

Income is a major factor limiting the availability of technology and broadband to some families. Low-income families may rely on smartphones to get online and do not have access to different devices like laptops or tablets, and this particularly affects families with school-age children, according to a study finding that 35% of this demographic were without broadband service in 2015.<sup>(4)</sup> Additionally, data caps on broadband and the sharing of online resources amongst low-income families also creates challenges with children completing school work as there are competing priorities in the household that require access to the internet.

Enrollment Demographic in Public Schools (2)



In 2019, about 56.6 million students attended elementary and secondary school, with a majority of students attending public schools. The demographic of schools in 2018 included 52% of non-Hispanic white students, 24% of Hispanic students, 15% of African American students, and 6% of Asian students; an increase from 2017.<sup>(2)</sup>

Historically in the school system, statistics show that African American and LatinX students face more barriers and challenges than white students. African American and LatinX students have less access to talented education programs, are often enrolled in schools with fewer qualified teachers and those with lower

The COVID-19 pandemic pushed people into their homes and onto the internet: 55 million students were doing online schooling, virtual medical appointments increased from 36 million to 200 million appointments, and online shopping increased by 77%.<sup>(1)</sup> However, not everyone has the ability to adapt to the changing world. The technology disparity that existed before has only been exacerbated by the pandemic, and proves particularly challenging for students in low-income and rural areas. The biggest challenges seen in the virtual classroom are still the lack of digital devices for students and the lack of available broadband at home.<sup>(3)</sup>

An additional challenge caused by the pandemic was the decrease in available public resources. Students that rely on services such as the public library to access the internet were now even more constrained in their ability to do schoolwork, and some communities may not even have the public establishments that offer free wifi.<sup>(4)</sup>

Additional findings show the difficulty in obtaining teaching resources and the ability to consistently reach students in low-income areas. In these areas, nearly one-third of students were not logging in or making contact with the teachers and almost three times the amount of truant students were reported in the lowest income areas. Similarly, urban, rural and high-poverty districts were facing challenges in providing online learning opportunities for all students equally.<sup>(3)</sup>

Students in low-income areas were also missing out on the social experience important to the educational experience, such as social interaction with fellow students and face-to-face interactions with the teacher as low-income areas were much less likely to offer live instruction. In high-income areas, leaders of these districts were twice as likely to report providing live instruction than district leaders of low-income areas.<sup>(3)</sup>

Conversations with various teachers reflect the difficulties with online schooling discussed above. Teacher N. is a teacher in a partial hospital system in Pennsylvania, working with special education students from low-income

areas and she shared some insights into what it is like teaching in a virtual classroom. Her school district had been hit hard by COVID-19 and the shift to the virtual environment. In the transition to online schooling, the school district offered take-home technology to students. However similar challenges emerged here as with other districts in that students did not have access to wifi to utilize the take-home technology. Additionally, some students may have had home lives that could create distractions, and students may have been dealing with extra layers of baggage unrelated to school that impacted their ability to focus on learning. There also may not have been an adult home to help support this online learning and help the student get set-up in a new environment. Even with the provided technology, sometimes the technology was not always age appropriate. For example, Teacher N.'s students were elementary age with special needs, and therefore they were not always able to read instructions on how to submit work online which created unforeseen disadvantages when there was no adult help. On top of this, when the shift was first made to go virtual the school district was not ready with resources, which resulted in some students being out of school until May 2020 and some even as late as the fall.

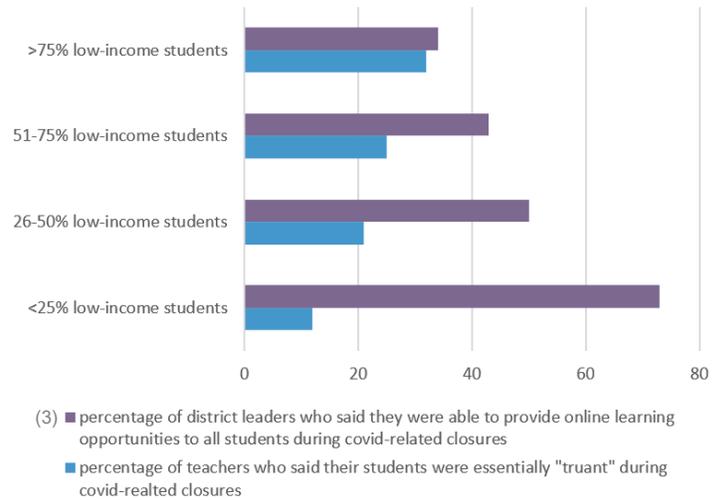
*“Overall, my biggest challenge of teaching during the pandemic, professionally, was managing to make education and access to school as equitable and appropriate to all students as possible. There are already so many systemic injustices and inequities in education, and teaching remotely, on a hybrid model, and with constantly changing schedules only highlighted and reinforced those barriers for students who were already marginalized by the education system.”*

- Teacher N.

Even with the provided resources, there were still numerous challenges that stacked up against the students having access to technology. Teacher N. shared some additional reasons why some students might have struggled to gain access to online schooling: inconsistent billing for internet services, poor wifi access or lots of people using the same network, moving around, needing to move to another household for daycare, and even homelessness. The home environment was the largest barrier to online education, as the lack of digital access combined with unsuitable work environments such as having to call in from a car or lots of background noise, made it hard for students to learn. Beyond the home lives of individual students, school districts were also under an increase of pressure from the pandemic as they tried to adapt to the new environment, leading to inconsistent scheduling, experimentation with different online platforms, and even teachers quitting.

With all of these factors, it was hard to foster an online educational system for those in low-income districts. Teacher N. shared that to support online learning, she and her students would have needed access to wifi technology, adult support, access to age appropriate formats to complete and submit work, and a form of childcare while the students attended school. Without these resources, students were falling behind and were not getting the same educational opportunities as their peers in high-income school districts, further widening the digital and educational divide across class and race.

Teacher B. saw similar challenges in her classroom of kindergartners in Delaware, and through the COVID-19 pandemic had to teach in a hybrid model where some students came into the classroom two days a week and remained virtual for the other three. Teacher B.'s students came from all over the district and the student demographics were about 55% Caucasian, 23% African American, 10% two or more races, 8% LatinX, 2% Asian, and 2% Native Hawaiian or other Pacific Islander. Many of her students lived in rural areas and faced similar problems with



access to the internet as discussed previously in this article. To help with the lack of technology infrastructure, the school district worked with local companies to provide hotspots to individual families and locations around the district, however the efforts were not always successful.

Prior to COVID-19, the district did not have 1-to-1 technology for all of the students. When the COVID-19 pandemic first started in March 2020, it took a while before each student had access to a device that they could use for online learning. In the beginning, some students were joining from their parent's cell phones or were not joining at all because of this. An additional disparity that Teacher B. faced was the quality of the devices that were given out to students. Many of the Chromebooks the kindergarten students received were old devices that the upper grades no longer used. As a result, the students frequently ran into issues with features and updates not working properly on these devices.

In addition to the technology disparity Teacher B. observed, there were additional challenges she faced as a kindergarten teacher that highlights the many facets of issues with online learning. Her students were experiencing the school setting for the first time which could be difficult enough even without the remote atmosphere. These students were also given Chromebooks and were expected to log on for daily Zoom lessons and complete individual assignments, which became a major problem as the students and their parents were not familiar with the devices, again highlighting how important parent or guardian support is to the

success of online learning. Even beyond the technology challenges, in kindergarten, there was a heavy focus on letter identification, the sounds each letter made, and letter formation. Teacher B. had to teach this remotely, and it proved to be very difficult as students often had a hard time distinguishing the sounds of the letters due to the quality of the sound coming through the Chromebook. In the hybrid environment, Teacher B. was required to keep her mask on which prevented the students from seeing her mouth as she emphasized each letter sound and from hearing her clearly. When Teacher B. was teaching letter formation, it was difficult for students to learn spatial awareness when writing on paper and even to learn how to hold a pencil. In the virtual environment, it was difficult for Teacher B. to provide support to the students when she could not always see what they were doing. In this classroom setting, there were unforeseen challenges that extended beyond the quality and quantity of available technology. These challenges are important to consider and acknowledge in this new virtual world.

*"If we want teachers, students, and families to be successful using online resources we must give them the time and materials necessary. Successful students are not built overnight."*

- Teacher M.

In an elementary school in Texas, Teacher M. faced similar technology challenges to other districts during the 2020 pandemic. At the start of the shift to virtual learning, not all of the students had access to devices to attend the online classroom. One device was initially given per household, before the district eventually got a 1:1 ratio of student-to-device, so if there were multiple children in the same household they had to share the technology at the start. This issue combined with the lack of internet access made it difficult for students to log-on to the virtual classroom in the first few weeks of the pandemic. Teacher M. only saw about seven out of thirty-five students at the start, and these remained the only consistent attendees throughout the pandemic. Truancy remained a consistent

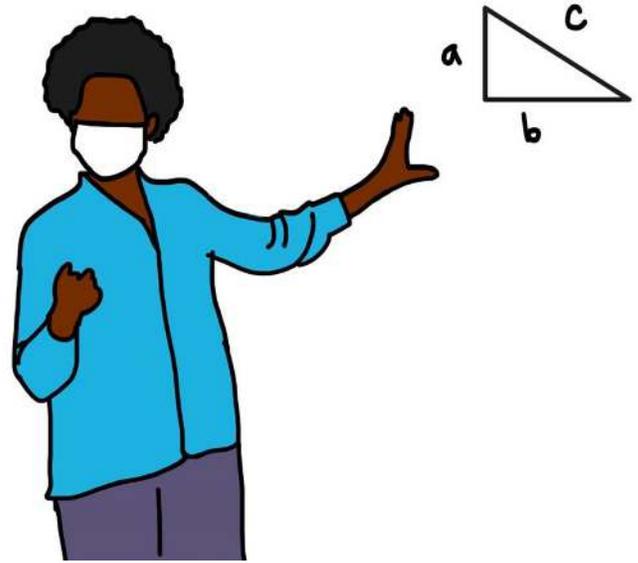
problem throughout the school-year, even once some students were back in-person. Some of the student absences could have been attributed to illness because if the student contracted COVID-19, or was exposed to it in some way, they had to stay home for fourteen days and were not expected to log-on. Sometimes this resulted in the students getting behind on lessons, and in this hybrid environment it was difficult for them to get back on track. Other reasons for non-attendance include the students not being engaged through the computer environment, a lack of parental oversight especially if the parent needed to go into work in-person, and technology challenges of accessing the internet or obtaining devices. Truancy was one of the biggest hurdles for Teacher M., and it was realized in the amount of students that failed her class. In the previous year, Teacher M. saw only about three to four failures amongst her students, but in 2020 there were about seventeen - a stark contrast. Most of these students would have to attend summer school, but would sometimes get retained into the next grade. This number makes clear the difficulties on both the teacher and the student in navigating the online learning environment.

Teacher M. also faced some other unique challenges outside of the technology disparity. A large population of students were LatinX and not all spoke English, nor did their parents. Combine this with the fact that some students entering the first-grade might have been attending school for the first time created a lot of challenges when it came to understanding and utilizing the technology resources. Some teachers in this district were bilingual, but not all were. There were various applications used for lessons in the virtual environment, but there were many more math-based applications than those that could be used in an English language class, and any reading applications would often be in English with no translation. Fortunately for Teacher M., most of her students spoke English, but when it came to communicating with their parents, sometimes a translation application was used to help the communication between the teacher and the parent. This language barrier created an additional obstacle for both the teacher, the parent, and the student needing help.

A lot of work fell to the teachers in the district to help students through the new environment. Teacher M. helped set up and run typing classes as many students had never used a computer before, especially if it was their first time in school. On top of this, a lot of Teacher M.'s work was done outside of normal school hours to help the students and parents during the difficult time. Once allowed, Teacher M. did home visits to students to help them with technology troubles or to help catch them up on missing work. Sometimes when parents were working front-line jobs or multiple jobs, she would set up separate times for parent-teacher conferences and try to be as accommodating as possible to help ensure the success of her students. Even with these mitigations, it was very difficult to keep students on track and it resulted in the drastically higher number of students unable to keep up that year and ultimately fall behind.

Teacher M. shared that what could have helped was the teachers having more preparation and meetings with the parents at the start of the pandemic to help give them the tools to support their children with this new technology. With both the students and the parents navigating this new world together, it made it difficult for children to have a proper support system that would set them up for success. However, given the uncertainty and constrained resources at the time, the students, parents, teachers, and school district did the best they could with what was available to them.

In an urban, North Carolina school district, the same challenges and lessons learned echo the ones discussed previously in this article. In an elementary school with a high minority population, the technology disparity was high compared to schools in the areas with richer resources. This again made the transition to the online learning environment harder on the students, teachers, and parents. Teacher S. is a 3rd-grade teacher with mostly African American and LatinX students in a government-funded school. Through the entire school year, Teacher S. instructed in the virtual classroom even when students had the option to go back in-person. This school kept the option available for parents so they could decide if they wanted their children to be in the in-person or virtual classroom.



Like many other schools, at the beginning of the pandemic getting devices and broadband to students and their homes was a challenge. Initially there were dozens of thousands of computers on backorder in the school district so it took time to get students technology access. Students obtained technology in a variety of ways including donated, at-home, and district-obtained devices. Besides the devices themselves, there were a lot of broadband issues as well. The solution to this problem was getting Verizon hotspots, however not all of these were functioning correctly, so Teacher S. still saw a lot of problems with students unable to log-on. Sometimes the students struggled with a support system at home and did not have adequate help in logging into the school platform which contributed to student truancy. Teacher S. found that other family members could be using the device, the parents lacked the education to know how to use the device, and in one case homelessness was a factor. Teacher S. had a student who worked out of a hotel and noticed the parent did not have transportation, so she would drop off school materials herself for this student and others whose parents could not get to the school. Fortunately, the school also had buses that could deliver materials if they needed to be taken to students. In addition to distributing materials, Teacher S. would spend time after the school day shifting around her schedule to meet with working parents or their children if they could not attend school during the day.



Once students logged into the virtual classroom, Teacher S. tried to make the learning environment as fun and supportive as she could. She primarily utilized Microsoft Teams for her lessons and she started her school days off with non-academic time to keep the students engaged such as hosting scavenger hunts or playing word and rhyme games. This was a fun time for students and helped make them feel comfortable, but she still found challenges in keeping the students engaged and attending full-time. For some students, learning was a difficult process on their own and if they were attending in-person there would be a lot more support for them. Some students had trouble reading and therefore using the internet was a huge struggle. In some



Six in twenty-six students consistently logged on in a given week

instances, Teacher S. had a couple of students who would log-in for the morning play sessions, but would not stay for the academic portion of the school day. Similarly to the classroom in Texas, Teacher S. only saw six students out of twenty-six consistently logging on throughout the week. Fortunately these students were engaged and excited about learning and were able to keep up throughout the school year and still enjoy learning, but for others it was more difficult. One student never showed up to the online classroom and many had difficulty keeping up. However

even with these learning difficulties, all students would get pushed up to the next grade and only some would need to attend summer school.

Despite these challenges, Teacher S. saw some positives amongst her students. For those that were attending, they were excited about learning and she was able to successfully reach a few of her students and provide them with an enriching learning experience despite the virtual environment. She was also proud to see how her students came together to help each other. Oftentimes, the screenshare ability with Microsoft Teams proved critical to helping deal with technology issues. Teacher S. could share her screen and walk the students through the technology issues, and then the students were able to turn around and do the same thing with their fellow classmates, showcasing and growing her students' leadership capabilities.

Even with these successes, Teacher S. shared her point of view when it came to what could have helped her and her students achieve better success with online learning. She believed that having volunteers who were trained and able to provide technology support would have helped the teaching staff and their students immensely. This help might have made it easier for the students to access the online classroom and therefore help improve their morale and willingness to learn if they had fewer obstacles in contacting Teacher S. There also needed to be a more equitable distribution of technology resources and ones that consistently worked. Just because the devices were available, does not mean they were the best quality. Teacher S. saw how even if a device was provided, if it was a hand-me-down it often had its own technological issues. Even when materials are provided, it is important to consider their effectiveness and think deeply about how equitable these solutions really are.



Overall, the COVID-19 pandemic caused schools all over the US and the world to adapt quickly and with little preparation to the online environment. Schools, teachers, students, and parents adapted as best as they could with the resources they had. This was a challenging year, and many rose to the challenge, however there are still important lessons to be learned and acknowledgments to be made in recognizing the disparities that exist in technology, schools, and communities. These technology disparities seen between high- and low-income areas do not affect school activities alone. A lack of technological resources, infrastructure, and broadband impact other areas of life as well, including the ability to reach K-12 students through outreach activities. As we are forced to connect creatively, it is imperative to remember these inequities, consider the inclusivity of current outreach tactics, and understand the circumstances and challenges that exist in the communities we are trying to serve.

Finally, thank you to the teachers who provided the interviews for this article and offered their perspectives, and who gave us a window into their lives and struggles throughout this past year. Thank you to the authors of the resources that we utilized in this work who have helped spread awareness of the technology disparity. And thank you to teachers everywhere who wake up everyday to enrich the lives of their students and communities and ultimately make this world a better place.

Please continue reading to see tips and best practices on creating equitable and inclusive outreach events, and examples of successful events.

## Resources

- (1) Darrell West, John Allen. "How to address inequality exposed by the COVID-19 pandemic." *TechCrunch* (2020). <https://techcrunch.com/2020/10/27/how-to-address-inequality-exposed-by-the-covid-19-pandemic/>.
- (2) Hanson, Melanie. "K-12 School Enrollment & Student Population Statistics ." *educationdata.org* (2021). <https://educationdata.org/k12-enrollment-statistics#enrollment-statistics-based-on-ethnicity-and-race>.
- (3) Herold, Benjamin. "The Disparities in Remote Learning Under Coronavirus." *EducationWeek* (2020). <https://www.edweek.org/technology/the-disparities-in-remote-learning-under-coronavirus-in-charts/2020/04>.
- (4) Lee, Nicol Turner. "What the coronavirus reveals about the digital divide between schools and communities." *Brookings* (2020). <https://www.brookings.edu/blog/techtank/2020/03/17/what-the-coronavirus-reveals-about-the-digital-divide-between-schools-and-communities/>.
- (5) Simama, Jabari. "It's 2020. Why Is the Digital Divide Still with Us?" *Governing The Future of States and Localities* (2020). <https://www.governing.com/now/its-2020-why-is-the-digital-divide-still-with-us.html>.
- (6) UNCF. "K-12 Disparity Facts and Statistics." *UNCF* (2021). <https://uncef.org/pages/k-12-disparity-facts-and-stats>.

# Tips and Best Practices

Planning virtual outreach events can be intimidating, but with these tips and best practices, you will be able to hit the ground running. Have your own best practices? Share them with us by filling out our [feedback form](#).



## Fundraising:

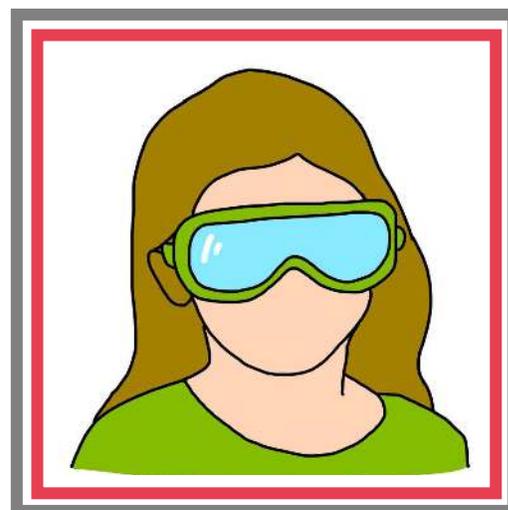
- Enter SWE outreach contests like the [Wow! Innovations Challenges](#).
- Consider hosting a SWE boutique or sell custom STEM items like stickers or t-shirts. Don't forget to follow SWE branding guidelines.

## Event Planning:

- Virtual panels are a low-cost way to promote audience interaction.
- Consider using pre-recorded content to give your volunteers time to prepare and transition to the next activity or sessions.
- Make a YouTube video to help explain topics. The participants can watch it again later, plus you can use the video at future events.
- Looking for more volunteers? Reach out to your section's alumnae network.
- Find social distanced ways to do in-person activities. Consider hosting a booth at local farmers markets or outdoor nature walks.

## Diversity and Inclusivity:

- Include pronouns when introducing yourself.
- Make sure everyone's voice is heard using a round robin for students to share opinions.
- Find diverse representation for guest speaker opportunities.



# Girl Scouts STEM Festival



SWE is proud to partner with Girl Scouts of the USA (GSUSA) to build female leaders and encourage girls to explore STEM, build confidence, and pursue careers in STEM fields.

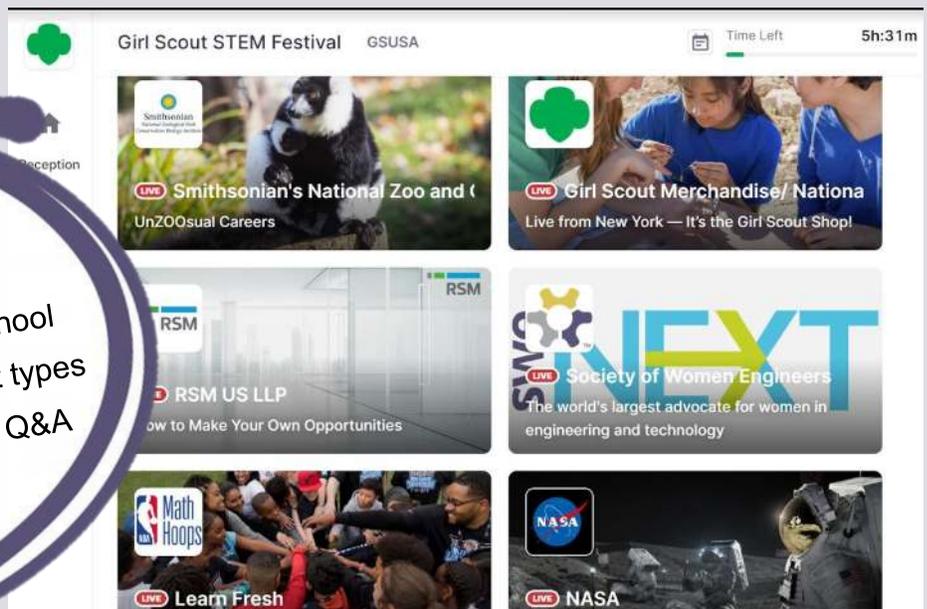
Through our national collaboration, we encourage our SWE Sections to work with local Girl Scout councils to host joint events and STEM programming for Girl Scouts, provide SWE volunteers with more opportunities, and give girls more engineering experiences by offering SWENext membership to all Girl Scouts.

This year, the SWE Outreach Committee virtually participated in National Girl Scouts STEM Festival on April 17th, 2021.

Over 12,000 girl & 2,400 adult participants were able to create their own STEM experience, choosing from dozens of hands-on activities, live events, fun challenges, and booth experiences! Girl Scouts had opportunities to earn badges and awards! SWE was one of 30+ booths that offered live chat time, inspiring videos, and fun downloads!

At our booth we received a variety of questions about what life as an engineer is like. The virtual platform was hosted on Hopin which could track visitor stats:

Total number of Visitors	651
Average Visit Time (mins)	12.6
Unique Visitors That Interacted	91
Poll Responses	330
Number of Comments	228
Total Number Interactions	265



**Theme:** Ask an Engineer

**Target age range:** middle - high school

**Topics covered:** SWENext, different types of engineers & what they do, polls, Q&A

# University of Arizona Highlight



## SWE Connect

**Theme:** Introduce young women to engineering, University of Arizona and SWE

**Other Organizations:** University of Arizona's College of Engineering

**Platform:** Zoom

**11** high school girls reached

**9** SWE volunteers - **12** other volunteers

## Event Description

Virtual events can be intimate too. University of Arizona SWE partnered with their College of Engineering to host a group of high school students interested in STEM. They started off with major-specific breakout rooms to discuss different engineering disciplines. Each participant was then paired with one of their SWE volunteers and the student was given the opportunity to ask questions in a "Get to know your SWEster" session. Guest speakers were available to the students through a panel to answer questions about undergraduate, graduate, and working life.



## SWE Ambassadors Lagos Nigeria

### SWE Ambassadors Visit

**Theme:** International Women Day and World Engineering Day 2021

**Platform:** In-person adhering to COVID-19 protocols

**50** high school girls reached

**4** SWE volunteers

**3** other volunteers



In commemoration of the World Engineering day (4th March 2021) and International Women's Day (8th March 2021), three SWE Ambassadors namely Catherine Omada Ameh, Mulikat Abubakar and Oyenmwun Idon visited the Girls Senior Secondary Grammar School hosting a SWENext club in Lagos Nigeria to carry out a SWE outreach and also to donate Covid-19 relief materials to the school. A total of fifty female students and three teachers were in attendance at the event.

Catherine Ameh gave the students a lecture on “choosing to challenge ” and also led them in setting SMART goals; this encouraged the students to ask several interesting questions about setting up goals and the questions were answered by all three visiting ambassadors.

Mulikat Abubakar spoke to the students about what to consider when making career choices even as they choose to challenge the norms. She also advised the students on the benefits of engaging in SWENext activities as the school is already listed as a SWENext club.

Oyenmwun Idon talked to the students about deciding career choices in Science and Engineering and also elaborated on how Gender shouldn't be a barrier to their goals and aspiration. She lectured them on the importance of taking their studies seriously and also gave them tips on starting their courses with good grades as this will affect their overall performance in the long run.

The goal of the outreach was to create SWE awareness, to share professional experiences and advice to the students thereby encouraging them to take on careers in STEM in order to create an opportunity for resourcefulness, innovation and interactions.

At the end of the event, some relief materials donated by all three visiting SWE ambassadors were presented to the school principal, Mrs. Omotoye, as a token of support to alleviate the covid-19 pandemic experience.

# Ohio State University Highlight

## College Mentor for Kids Engineering Intro

**Theme:** This day was to share the broad disciplines of engineering to the 1st to 5th grade Girl Scouts

**Other Organizations:** College Mentor For Kids

**Platform:** Youtube

**50** elementary school girls and boys reached

**7** SWE volunteers



## Event Description

Everyone needs a mentor, even middle-schoolers. In November, the members of Ohio State University SWE hosted an event for 1st to 5th grade Girl Scouts. Partnering with an organization called College Mentors for Kids in Columbus, Ohio, they were able to provide students with five different engineering activity stations. To make things more interesting, each station activity was recorded and made into a fun Youtube video for everyone to watch later. Before teaching students how to code in Scratch, the Ohio State SWE members put together a humorous skit comparing writing code to making a PB&J sandwich. It was a great way to engage students and simplify the STEM concept. You can check out their video [here](#).

## Activities:

1. Slime Science: material science engineering, polymers, and chemical reactions
2. Scratch programming: computer science and programming
3. Roller Coasters: civil engineering, design process, gravity, and physics
4. Paper Airplane: aerospace engineering, drag, drift, and airplanes
5. Pin Wheels: environmental engineering, types of renewable energy

## Pin Wheel Instructions

### Materials

1. Straws
2. Construction Paper
3. Paper Fastener
4. Scissors

### Instructions

1. Cut paper into a square
2. Fold square into four triangles
3. Cut  $\frac{2}{3}$  of the length into each fold from the corner
4. Bring every other point into the center
5. Push paper fastener into the center of the pinwheel
6. Push pin through pinwheel and into a hole in the straw
7. Bend fastener back and then spin wheel

### Science Explained

Motion is kinetic energy. On a wind turbine, the motion of the blades can capture the kinetic energy of the wind.



## Binary Names

### Materials (per student)

1. Pipe Cleaners
2. Beads
3. Printed out ASCII tables like the one pictured to the left. One for each girl, but they don't necessarily need to keep it. They can be left at the table.

### Instructions

1. The girls will take one pipe cleaner for each letter in their initials
2. White will represent 0 and black will represent 1 (or any color they want). They will put the eight beads on one pipe cleaner in the order of the binary representation of each letter of their initials.
3. Once each girl has all of the letters of her initials put on to pipe cleaners, she can put them all on another pipe cleaner in the order they go in.



# Poway High School SWENext

## Women in STEM (WiSTEM) Forum 2021

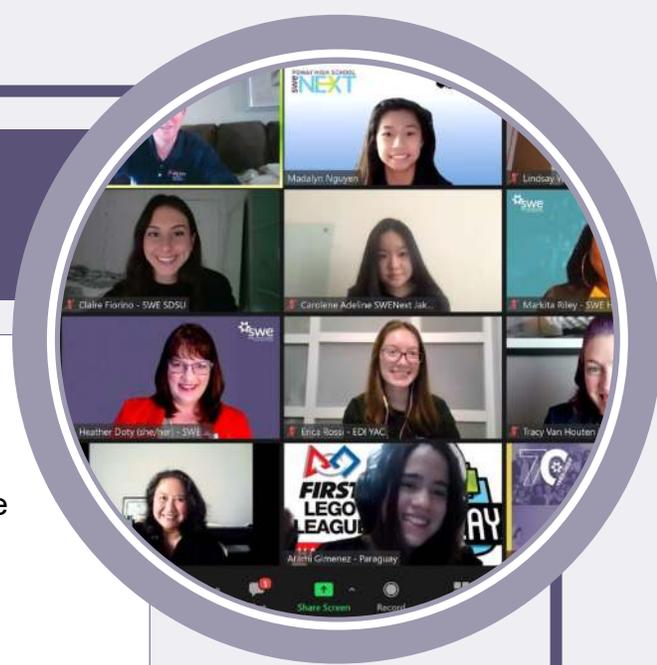
**Theme:** Dare to Dream

**Other Organizations:** University of Arizona's College of Engineering

**Platform:** Zoom

**300 K-12 students**

**Partners:** San Diego SWE, San Diego State University SWE, FIRST Robotics, Girl Scouts



The journey to create Women in STEM (WiSTEM) Forum 2021 started last January 2020. Poway Unified School District Board of Education approved WiSTEM Day resolution before the pandemic. However, it was cancelled due to Covid-19. Once again, it's been amazing to get unanimous board approval. Madalyn Nguyen (founder of Poway HS SWENext Club) organized & moderated the webinar. It was a huge success with global registrants from 3 different continents of K-12 students (Paraguay, USA, & Indonesia), FIRST Robotics, Girl Scouts, parents, educators, and professionals.

The WiSTEM Forum was a two day event offering sessions with guest speakers representing various STEM organizations. The Forum gathered many STEM panelist speakers including SWE leadership, Poway Unified School District representative.

The planning process for the event was started with getting a resolution passed with the Poway Unified School District Board of Education. We emailed a request for the event in January and attended a Board meeting in March to get approval to declare April 8 as Women in STEM Day. Once the resolution was approved, we started the creation of WiSTEM Forum by inviting guest speakers, putting out advertisements on social media, and sending emails to all the schools in the district, SWENext clubs and robotics teams. Madalyn Nguyen (founder of Poway (PHS) SWENext Club) and Tracy Nguyen (PHS SWE Counselor) organized the two-day event and Madalyn moderated the days of the event. This was an international event which required coordination with different countries spread across various continents, so one challenge in planning the event was working across multiple time zones.

As a volunteer and organizer of the event, Tracy Nguyen shared "it was quite inspiring to get feedback from attendees and requests to watch the webinar again." Even though challenges were faced when developing this event, especially being delayed due to the COVID-19 pandemic, switching to a virtual platform allowed Poway High School to reach a wider audience of attendees across the world, and invite guest speakers

# Rutgers University Highlight



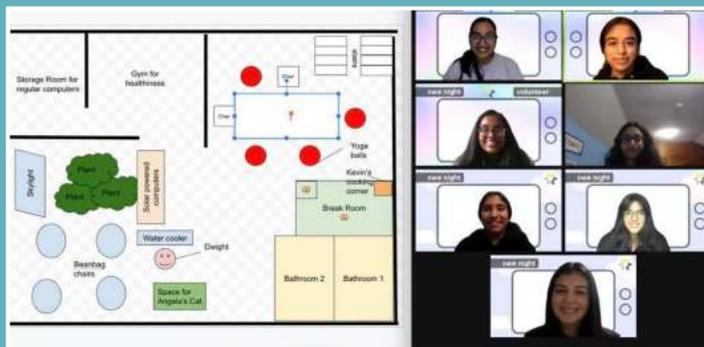
## SWE Night

**Theme:** early 2000s TV shows and movies

**Platform:** Zoom

**24** high school girls reached

**26** SWE volunteers



## Event Itinerary

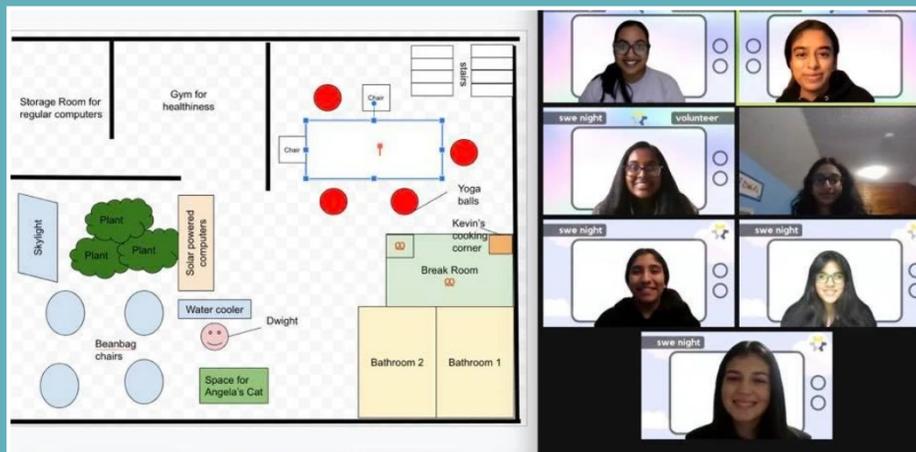
The following is the itinerary Rutgers SWE used for their event. They prepared a balanced outreach event where panels and talks were alternated with engineering activities and brain teasers to provide students with a variety of experiences.

1. Intro Presentation - We introduced Rutgers SWE to the high school girls.
2. Fun Activity - We divided into breakout rooms and started with an icebreaker called "This or That." The students and volunteers used the "Annotate" feature on Zoom to indicate which one they picked or liked better.
3. Puzzles with SWE - The volunteers shared two brain teasers and two image puzzles that the students had to work together to solve.
4. Student Panel - Nine panelists shared their experience and answered questions from the girls about engineering, Rutgers, and being a woman in STEM.
5. Alumni Speaker - We had one of the founders of Rutgers SWE Night share an inspiring speech about discovering yourself and being a woman in technology. She also answered questions from the students.
6. Engineering Activity - The students built their own office space or city using Tinkercad. We have a short pitch competition at the end.

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# Outreach Spotlights

The following spotlights were featured in our Adult Advocate Newsletter. If you would like to receive this publication on a monthly basis sign up for our emails [here](#).

## November



With COVID-19 making in-person outreach difficult, the [UC Berkeley SWE section](#) was able to transition their monthly SWE Science Sessions for elementary and middle school students to a remote format. These younger students would typically come to campus and participate in a hands-on engineering activity led by SWE college student volunteers. Instead, the section shipped material kits to the parents and sent out an [informative presentation with 16 different projects](#) that could be pursued with the resources given or with common household items. By being creative and pivoting how they do outreach in a pandemic, this SWE section was able to educate 50 more students about engineering.

The [Southwest Central Indiana section](#) recently hosted an event in which they passed out STEM activity kits to children at their local farmers market. They targeted the farmers market because it is often free for non-profit organizations who aren't selling anything. You can also reach a wide range of demographics there. Here are some tips for this in-person outreach event:

- Advertise your event to children's museums, libraries, colleges (student organizations) and schools. Consider coordinating with local organizations so that people have access to more nearby resources.
- Prepare pre-bagged materials for STEM activity kits ahead of time to reduce contact. We had coloring books, [Constance and Nano comic](#), [#BeThatEngineer brochure](#), ["how to make a parachute"](#) and ["soundproof bag"](#) materials which cost \$130 to make 80 kits. Be aware that some children may have younger siblings at home so try to avoid putting small items in the bags.
- Prepare a sign-up sheet for your booth in case parents and educators want to join your section's mailing list. We also had quite a few female engineering students stopped by our booth to meet our members and learn about SWE.
- Print out [SWENext newsletters subscription links](#) to pass out at your booth.
- Enjoy connecting with the local community and seeing children's smiley faces.



# Outreach Spotlights

## December

In September, the [East Central Iowa SWE section](#) hosted a cybersecurity and Java coding presentation for high school girls. The organizers sent information ahead of time for participants to practice coding on their own before engaging on the day of the event. The slides were formatted with enough detail so that all relevant information could be communicated effectively over a digital platform. In the Outreach Metric Tool (OMT), this section shared lessons learned from the event including that the presentation should explain the “why” behind each line of code, how everything pieces together, and relate the code to end user applications like robots. Also, learning to code can range from easy to complex and should be tailored to the audience. For beginners, information should be simplified and easy to follow along so the girls are encouraged to keep troubleshooting. Overall, this is a great way to introduce girls to a new topic and can be done on many different platforms!

## January

When COVID-19 forced events to become virtual, a Connecticut SWE section was able to quickly re-pivot and implement their hands-on Girl Scouts Virtual Engineering Workshop: Clean Water Challenge in May. The format of the event was a welcome with an introduction to engineering, video overview of a topic area, guided hands-on activity with experimentation/design and reflection, and then Q&A with professional engineers in the related field. The entire workshop was 1.5 hours with activities designed to use materials found around a house. In the Outreach Metric Tool (OMT), the section shared how these virtual sessions can be easier to plan than a full outreach day because they are shorter time commitments without many of the in-person logistical headaches! This was a great way for the section to continue outreach efforts and provide programming opportunities for 30 Girl Scouts despite the challenging circumstances.



# Outreach Spotlights

## February



In February 2020, a Tennessee SWE section and partner organization DiscoverE hosted 92 girls for “Introduce a Girl to Engineering Day.” In the submission to the Outreach Metric Tool (OMT), the section shared how calling everyone a week prior to the event, and then again the week of the event, significantly helped increase attendance. Although time consuming, it was a great way to start engaging with the girls! It even confirmed if there was an open spot that could be given to someone on a waitlist. The organizers hosted a role model training for the volunteers. From this training, the volunteers were better prepared to talk about themselves and start a conversation with the attendees, and those who participated in it seemed to have better experiences throughout the workshop. These are some great practices that could be implemented for your future events, whether in-person or virtual!

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## March

Every year, the [SWE Hartford](#) Certificate of Merit recognizes one male-identifying and one female-identifying junior class student who has demonstrated excellence in math and science classes from each high school in the Hartford region. The section reached out to every eligible

high school (over 200) to nominate students for the award, which resulted in responses from 60 schools with 115 nominees. In May 2020, this certificate was awarded differently than the typical in-person event due to COVID-19. Instead, the students received their certificates by mail as well as a letter from the SWE Hartford President explaining the possibilities that studying engineering would open for their future. Students were also given SWENext flyers and invited to connect with the section digitally (LinkedIn, Facebook, email). The society was able to continue with awarding this certificate and introducing these students to the wonderful community that is the Society of Women Engineers. This will be the section’s 37th year and if anyone would like to benchmark this process, please email [swehartfordawards@gmail.com](mailto:swehartfordawards@gmail.com) for more information.

# Award Winners

## WE Local

**Engaged Advocate Award** – Honors individuals within the following categories contributed to the advancement or acceptance of women in engineering: K-12 Educator; Collegiate Educator/SWE Faculty Advisor/SWE Counselor; Entrepreneur, or STEM Professional.

- Christy H. Drewry, NNSA Production Office
- Maricarmen Escamilla Jauregui, Cummins
- Stueti Gupta, BlueKei Solutions Pvt Ltd
- Christina Kull Martens, Northrop Grumman
- Yin Wai Vanessa Li, Novelis
- Anne M. Lucietto, Purdue University – Purdue Polytechnic Institute – School of Engineering Technology
- Tracy Nguyen, Essential Eyecare
- Optometry and Poway High School
- Terita Norton, The Aerospace Corporation
- Claudine Phaire, Lockheed Martin Skunk Works
- Bich-Van C. Pham, PepsiCo
- Jennifer Tanzillo, The Aerospace Corporation
- Anna Topol, IBM Corporation
- Tao Wang, Cummins

**Outstanding Outreach Event Award** – Recognizes a group or groups who plan and carry out a high-quality outreach event to inspire future engineers.

- California Polytechnic State University San Luis Obispo, Collegiate
- Colorado School of Mines, Collegiate
- Dallas SWE, Professional
- John Deere India Lakshya ERG SWE Team, John Deere India Private Limited, Professional
- Rocky Mountain Section, Professional
- Santa Clara University, Collegiate
- Society of Women Engineers at the University of New Mexico, Collegiate
- SWE at UVa, University of Virginia, Collegiate
- SWE Cummins College of Engineering for Women Affiliate, Pune, India
- SWE Space Coast Section, SWE Space Coast Section, Professional
- SWE Virtual STEMInists
- Upper Cumberland Section, Tennessee Tech University, Collegiate

## WE20

**Distinguished Engineering Educator Award** – Presented to an individual who has made significant contributions to the engineering profession through education.

- Janet Brelin-Fornari, Ph.D., P.E., Grand Canyon University
- Ruth E. Davis, Ph.D., School of Engineering, Santa Clara University
- Amy Wagoner Johnson, Ph.D., University of Illinois at Urbana-Champaign

**Mission Award: Best Practice - Outreach** – recognize SWE groups that embody SWE core values and demonstrate continuous improvement and growth as they work to achieve the Society's strategic goals.

- Dallas SWE, Professional
- Emerson Women in STEM Employee Resource Group, Professional
- Purdue University, Collegiate
- Society of Women Engineers—Detroit, Professional
- SWE Graduate Community, Collegiate
- University of Pennsylvania SWE, Collegiate



# SWENext Club Information



CALLING ALL SWE  
MEMBERS AND  
MENTORS!

**SWENext Clubs provide a space for K-12 students to explore engineering and have extraordinary out of the classroom experiences! The only requirement for a SWENext Club is that it must have an active SWE member (Professional, Collegiate, or K-12 Educator) serve as their SWE Club Counselor or Advisor. That person can be YOU!**

Interested in getting involved with a SWENext Club? Fill out this [Interest Survey](#)

## SWENext Club students need advocates and mentors like you to:

- Communicate regularly
- Stay up to date on the SWENext Clubs events, successes and challenges
- Get to know your counterpart (counselor and club advisor) and work as a team with the club
- Share opportunities within SWE and elsewhere
  - Joint events with other SWENext clubs, collegiate and professional sections
  - SWENext Newsletter
  - Scholarships
  - Awards
  - Conferences
  - Internship opportunities

# Creating Your Event



The SWENext Committee has put together an **Activity Guide** for you to start planning your next SWENext club event.

In order for events to be successful, they require a level of planning and preparation. To the left is a simplified process to use when creating events. The details of this process will be found in the guide linked below. This list should not necessarily be followed linearly. Many steps will need to occur simultaneously. Not all details included in this guide will pertain to every type of event, so be sure to use your best judgement about what needs to happen for your event to work!

**Find the complete guide here:**

[https://swe.org/wp-content/uploads/2020/08/club\\_activity\\_guide\\_07202020.pdf](https://swe.org/wp-content/uploads/2020/08/club_activity_guide_07202020.pdf)

# SWE NEXT



# SWENext Award Winners



## **Poway High School SWENext (San Diego, CA) - Best Practices Winner**

Congratulations to our SWENext Club Challenge winner Poway High School SWENext from Poway High School in San Diego, CA!

Poway High SWENext was founded in April 2018 by Madalyn Nguyen. Just shy of 20 members ranging from 9th to 12th grade, their mission is to support each other in becoming engineers and STEM leaders, as well as to serve as positive STEM role models and inspire younger girls. They engage with their local professional and collegiate sections to explore engineering careers, go on field trips to local engineering firms, organize numerous outreach events, and help other local high schools start their own SWENext clubs.

One of the club's most impactful outreach events is a Girls in STEM Inspiration Day. During this event, 70 K-8th grade students learned about many different engineering fields through a round-robin session with high school and college students and professional engineers. Attendees also toured a machine shop, learned about machine learning, 3D printing, laser cutting, and more! Another successful outreach event was the club's seven-week webinar series on different STEM careers. The webinar, which was attended by over 700 people, included presentations by engineering industry leaders, rocket scientists, healthcare professionals, and advocates from the SWE Student Programs Committee. 90% of attendees surveyed after the webinar indicated future STEM career interests.

Poway High SWENext won this award for their unwavering commitment to STEM outreach. They were able to attend the virtual SHLA program at WE20 and received t-shirts and other goodies for their club. [Watch a clip of the winners here.](#)

# SWENext Award Winners

## Congratulations to the Northrop Grumman Community Award Winners!

The SWENext Northrop Grumman High School Community Award Program emphasizes the impact SWENexters in grades 9-11 can have in their communities to solve real-world problems. The award stresses the interconnectedness of the SWE Community and gives awardees a chance to interact with SWE members, companies and colleges. This year, the Community Award winners presented their posters virtually to professional engineers! This year's theme was cybersecurity. Their posters described how the Information Security team of New Orleans can prevent cyberattacks and educate citizens about identity theft prevention.

The award winners were: Vanesha Hari, Katherine Cheng, Geetika Chitturi, Izabella Pollett, Liberty Dilbeck, Ashika Palacharla, Samyukta Iyer, Aroshi, Priyanka, Sarah, Natalie, Christine, Madalyn, and Emerson. The Ultimate Team Winners were Faye Liu and Kayla Lowenberg, and the Ultimate Individual Winner was Rhea Jethvani.

[Videos of the winners can be viewed here!](#)



## Congrats to our SWENext Club Challenge Winner!

SWENext Clubs across the country created a video that contained a demonstration of a hands-on engineering activity the club developed for elementary or middle school-aged students. The demonstration used common household items and contained a virtual component. [Watch a clip of the winners here.](#) The LionsNext club from Peachtree Ridge High School in Suwanee, GA won for their [membrane activity demonstration](#) and the students were able to attend the virtual SHLA program at WE20 and received t-shirts and other goodies for their club.

# SWENext Award Winners

## SWENext Global Innovator Award

These outstanding future engineers and computer scientists were honored with the **SWENext Global Innovator Award** at the WE20 annual conference in November 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. Award recipients exemplify intellectual curiosity, enthusiasm, and leadership in the STEM community. Here are the award winners:



**Sara**, an aspiring Chemical Engineer from California, was one of the founding members of her high school's SWENext club, and currently serves as its Co-President. As Co-President, she helped organize a careers lecture series, taught over 100 middle and elementary school girls about the engineering design process, and traveled to Asuncion, Paraguay to help bring more STEM opportunities to the community. She also serves as the Business Lead on her robotics team, through which she has learned how to program in both C++ and Java as well as how to use various engineering machines, including mills and laser cutters.

**Amy**, an aspiring Environmental Engineer from Louisiana, is co-chairing the TechNOLA initiative, which will serve as a beacon for high school students interested in computer science to gain skills in networking with organizations, lobbying for STEM initiatives, and teaching middle schoolers block-based code. She has also performed extensive research to highlight qualitative and quantitative data on girls' involvement in STEM and how communities can dismantle STEM gender barriers, applying her findings to her school's SWENext Club.

**Sriya**, an aspiring Biomedical Engineer from North Carolina, designed the SkyWay device to mitigate the environmental effects of invasive carp in the Missouri River. She has founded and led three SWENext chapters, allowing her to positively impact over 1,200 women in her community through STEM outreach events, college shadow days, and engineering challenges. As an intern for the North Carolina governor, she organized the first Lenovo App Challenge and guided students from rural North Carolina in creating a user-friendly app to track the disease rate for livestock and crop harvesting cycles.

# SWENext Award Winners

**Shayne**, an aspiring Robotics Engineer from California, has mentored 5 robotics teams, guiding the students to effective solutions while teaching aspiring female engineers to confidently voice their ideas. As President of her high school's robotics team, she organized "As Women, We Rise," a women in STEM panel featuring over 10 female professionals from companies like NASA and Qualcomm. The event, which included activities like live robot demonstrations and an anti-bias presentation, inspired over 100 girls and shared insight into the engineering world.



**Shivani**, an aspiring Software Engineer from Georgia, has written numerous articles for the National Girls Collaborative Project and Reinvented Magazine detailing her experience as a female in STEM. She co-founded an organization called CodeHers Collective which has taught over 100 students in 6 countries. She also has served as president her school's SWENext and Girls Who Code clubs, where she aimed providing free, accessible opportunities to empower women in STEM in her area. As SWENext Club, she established a partnership with the Georgia Tech SWE Chapter, hosted numerous engineering outreach events for young students, and helped her club win the 2019 SWENext Club Challenge.

**Aishwarya**, an aspiring Environment Engineer from North Carolina, conducted a data science research project with NC State's statistics department, creating a model to predict whether a person would develop dementia based on a set of initial conditions. She also conducted independent research related to agricultural waste treatment in order to improve the quality of life for low-income and minority communities located near agricultural facilities. She also serves as president of her school's SWENext Club.



## Honorable Mentions:

Fortune – aspiring Software Engineer from Nigeria  
Alexis – aspiring Biomedical Engineer from California  
Lauren – aspiring Computer Scientist from New Jersey  
Benedictha – aspiring Computer Scientist from Nigeria  
Natalie – aspiring Biomedical Engineer from Thailand

Ayannah – aspiring Aerospace Engineer from Virginia  
Ava – aspiring Aerospace Engineer from Massachusetts  
Faith – aspiring Engineering Psychologist from California  
Anastasia – aspiring Robotics Engineer from Missouri  
Alayna – an aspiring Computer Scientist from Illinois

# Wow! Innovations Challenge

The Outreach and SWENext Committees hosted the WOW! Innovations Challenge in the spring of 2021. SWE members were challenged to virtually showcase their SWE section in a time when it would be difficult to engage in-person. SWE collegiate and professional sections, affiliates, and MALs were asked to create a three to five minute video about what makes their collegiate or professional organization great.

SWENexters and SWE collegiates will be able to watch these videos to learn about colleges and professional sections across the country and why being a SWE member in college and beyond is a great experience.

Past SWENexters have testified to the impact of these videos and how much they can reveal to them about a SWE section they might otherwise never find out about. Ayannah, a high school senior from Virginia, said the videos were a great gateway to learning about SWE and finding the school where she belonged. She shared: "I have been worried about not making that many friends in college especially if it's in a new environment that's thousands of miles from Virginia. But getting to look at [these] videos was so inspiring because of the fun activities all of the girls were doing together while at the same time getting to make connections that will help them further their careers."

Participating sections submitted amazing videos that showcased their love for engineering, SWE, and their colleges and universities. Thank you to the SWE sections who submitted videos! Thanks also to all the volunteer judges who helped review the videos.

Congratulations to the winners!

## Collegiate



### 1st Place

*Drexel University SWE*

\$1000 prize to use for future outreach events

[Video Submission](#)



### 2nd Place

*Colorado School of Mines SWE*

\$500 prize to use for future outreach events

[Video Submission](#)

## Professional



### 2nd Place

*Central Illinois SWE*

\$500 prize to use for future outreach events

[Video Submission](#)



### 1st Place

*East Central Iowa SWE*

\$1000 prize to use for future outreach events

[Video Submission](#)

For more information about Wow! Innovations Challenge visit the [website](#)



# Helpful Resources

## Outreach Metric Tool (OMT)

**Don't forget to submit your events to the [OMT](#). Preview the OMT [here](#)**

## Newsletters

**Adult Advocate:** [link here](#)

**SWENext:** [link here](#)

## Outreach Toolkit

Step-by-step [instructions](#) and resources to refer to when planning an outreach event or program

## Fun Engineering Activities

### Elementary School Clubs

Find K - 5 activity challenges and how to activity videos [here](#)

### Middle School Clubs

Find grade 6 - 8 activities, articles, and videos about different engineering disciplines [here](#)

### High School Clubs

Find grade 9 - 12 resources for free activities, challenges, competitions, and clubs [here](#)

## Photo Release Forms

**Adult:** [link here](#)

**Minor:** [link here](#)

**Other Resources:** [link here](#)

## Program Development Grant

Apply for a micro-grants to support the strategic activities of SWE Organizations [here](#)

## SWE.org Outreach Programs

Explore the various resources on [swe.org](#)

**SWENext Clubs:** [link here](#)

**SWENext Challenge:** [link here](#)

**Invent it. Build it.:** [link here](#)

**STEM Powered Expo:** [link here](#)

**Adult Advocates:** [link here](#)

**Educators:** [link here](#)

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