2019-21 Voya STEM Futures Program

In 2019, the Association of Science and Technology Centers (ASTC) launched Voya STEM Futures, a Voya Financial-funded program developed for ASTC's science and technology center members. The program provided $15,000 in seed funding for ASTC members to develop or enhance programs that connect youth in grades 4–8 (ages 9–14) to STEM career possibilities. In the wake of the COVID-19 pandemic in early 2020, seven science centers and museums pivoted to adapt their programs to meet new circumstances and needs.

Museum and Science Center Project Summaries

Arizona Science Center (ASC) designed Girls in STEM workshops to bring together girls in grades 4–8 to learn about STEM topics by working in teams on specific STEM challenges and problem-solving activities, with help from female STEM-professional volunteers. The funding gave ASC the opportunity to expand the program to include an additional Girls in STEM program.

Held on the first Saturday in February 2020, 100 girls in grades 4 to 8 participated in the ASC's spring Girls in STEM program. These girls collaborated with their peers to solve engineering-design problems and connect with women in STEM careers who enthusiastically mentored the young women. This specific program included different hands-on activities including LED wearables and creating their own robot challenge. The goal of the event was to expose girls to interesting and engaging STEM-related activities and concepts that capture their curiosity and spark their interest in learning more. Throughout the day, the girls were encouraged and supported by female mentors. Not only did they serve as amazing and energetic mentors for the day, these mentors also helped to introduce the girls to viable career paths in science, technology, engineering and math related fields.

Liberty Science Center (LSC) pivoted to providing virtual programming because of its closure at no-cost to families of students in middle and high school who were required to transition from in-school learning to remote (at-home) learning in 2020. LSC used Facebook Live streaming to virtually highlight STEM careers to these students, utilizing content from its Live From Surgery series.

LSC presented a total of 12 virtual STEM career events. The online series included topics in the healthcare and medical research fields such as kidney transplant, where 419 live viewers learned about the organ donation process and the team that makes it happen. Cardiac Classroom focused on understanding the mechanisms behind coronary artery disease and drew 200 live views. Cow eye dissection and sheep heart dissection highlighted careers in ophthalmology and cardiology respectively, with peak live views totaling 756 viewers. Exploring the engineering and

design processes by participating in the 3D prosthetics presentation and Robotic surgery presentation had a total of 382 peak viewers.

Families of middle school and high school students also had the opportunity to direct questions to experts during the science center's two-day event with a virtual Career Panel, which included speakers from surgical fields like Registered Nurses, Physician Assistant, and University/ Research positions with Janssen and Rutgers University. The total number of live viewers for the Career Panel alone was an impressive 254 live viewers and a total of 2,700 viewership.

In sum, LSC drew 2,942 peak live viewers across the 12 sessions and a total of 51,600 views following the events.

MIT MUSEUM was able to host one Girls Day event in October 2019 before pivoting planned onsite and in-person events to a virtual environment. It focused on our watery world and featured female scientists and engineers in the environmental science fields, oceanography, and climate science.

The MIT Museum pivoted all programming to a virtual environment in February 2020. Funding from Voya supported the creation and implementation of The Virtual Idea Hub, a new, online weekly program aimed at engaging youth and families in hands-on making and engineering activities using everyday materials. Between May 2020 and December 2020, the Museum saw 595 program participants over 34 online sessions.

In the fall of 2020, the annual Girls Day event was held online. The full day of online programs featured four female scientists sharing their work with families, and four hands-on activities led by museum staff and female scientists role models. A total of 157 attendees participated in this unique day of online programming specifically targeting girls and their families.

The two Girls Day events (one in-person, one virtual), and 34 on-line Virtual Idea Hub family making and engineering sessions events reached over 1,450 participants.

THE MUSEUM OF SCIENCE AND HISTORY, JACKSONVILLE (MOSH) held two, in-person Girl Scout outreach programs prior to March 15th of 2020 – a Cadettes Engineering Badge program that served 28 scouts, and Daisies Coding Badge which served 16 scouts. MOSH pivoted to support Education Department staff time to develop MOSH Connect online programming, delivered between March 15th and May 31st, 2020.

Key audiences included K-12 students, teachers, and families. Between March and May 2020, MOSH produced a total of 41 videos which accumulated >125,000 total views and impressions on the Museum's online platforms (YouTube, Facebook, MOSH's website, etc.). Through this virtual platform, MOSH also provided four virtual STEM workshops to 142 middle school students.

Tellus Science Museum shifted to a virtual footprint with live and recorded science demonstrations and lectures, family activities through the #Museumfromhome webpage which included experiments, interactives, Aha! moments, and other ways to serve our audience while keeping the museum relevant.

In spring 2021, Tellus adopted a family workshop format which more closely resembled with the originally proposed programming for Voya STEM Futures. The workshops were designed to give families a cross-section of scientific experiences and give participants access to in-depth educational programs and museum experts. Subject matter included rocketry, paleontology, the states of matter, solar energy, sand under a microscope, and the nature of stars. A total of 387 people (approximately 150 adults and 237 youth) attended the workshops.

The Works Museum held Tech Fest in person as planned in February 2020 before pivoting programming to the virtual environment. The funding allowed the museum to engage women working in STEM fields in the event, by providing hands-on activities and demonstrations affiliated with their work, a special breakfast where girls and their families could meet women working in STEM in a casual discussion format, and a workshop experience where the girls made LED bracelets. The Museum worked with a partner school district to reach girls underserved in STEM, including girls from low-income households, students of color and English-language learners, inviting them to participate in the breakfast and workshop, as well as the full Tech Fest event day. Event materials were translated to Spanish to support this outreach. In all, 125 people participated in the breakfast and workshop. The Museum expanded its relationships with both corporate partners and individual women who volunteered at the event and built its capacity to reach underserved audiences.

During its pandemic closure, the Museum developed a series of new virtual summer camps and school workshops delivered via Zoom with curbside pick-up of supplies, hosted three Explore It! Family events where families could join educators over Zoom to engineer together with objects commonly found around the home, created At-Home Engineering projects with instructional videos, and expanded its She Engineers online resources and career connections. She Engineers partners shared their STEM stories in guest blog posts and videos, which the museum posted to its website and promoted via e-blasts and social media. Stories featured included a robotics team, a STEM educator and entrepreneur, and engineers specializing in aerospace, defense, and environmental justice. In all, the Works Museum served 749 campers, 109 people at virtual Explore It! events, and 4,240 children through virtual workshops.

Connecticut Science Center produced a series of videos highlighting the career trajectories and work of four BIPOC STEM professionals in the areas of Chemical, Aerospace, and Robotics engineering in 2020. The videos were made available to local organizations like the Aetna Health Professions Partnership Initiative at UConn School of Medicine and the Black Males Club at the Academy for Aerospace and Engineering. Both organizations run Saturday enrichment programs

throughout the academic year specifically for BIPOC youths, and for the purpose of increasing awareness of and diversity within STEM studies and careers. More than 110 BIPOC students participated in this learning.

In 2021, a cohort of 12 students participated in three consecutive in-person, minds-on/hands-on workshops delivered by graduate students from the UConn Engineering Diversity and Outreach Center (EDOC) and the School of Health Sciences at the University of New Haven. The first workshop introduced the students to the field of Biomedical Engineering where they were guided in designing, creating, and testing an Atherectomy device to remove plaque from an artery. The second workshop introduced students to the field of Software Engineering and through activities using Scratch Programming, Circuit Playground and Circuit Basics and each student was able to create a holiday card with an LED component. The last workshop focused on Civil Engineering/Architecture where students learned about the causes and characteristics of earthquakes. They were then guided in designing a quake-resistant structure that was tested on a shake table.