

STEM 2 THE MAX

Exploring and Experiencing STEM in Our Everyday World



2018-2019



SAME PROGRAM, NEW NAME Thanks to a generous donation by Walmart and their continued partnership, the High School STEM Bridge Initiative was formed. In the midst of the excitement and discussion with our young learners about the possibilities of the Initiative, the students put their mark of buy-in on its name, changing it to STEM 2 THE MAX: HIGH SCHOOL STEM BRIDGE INITIATIVE. The student's branding is a sign of their ownership and commitment to the program. This report is the story of our pilot year.

STEM 2 THE MAX captured and encouraged student's interests in STEM and to do so, we implemented our schedule of program sessions with flexibility for student-voice and choice. We have found that, while guided by program staff, allowing self-guided exploration achieves a more formative experience that results in a deeper understanding of the subject matter. We have seen great success with these budding entrepreneurs and STEM professionals. This report highlights the activities and experiences that they students experienced, and the projects that they completed.

This year STEM 2 THE MAX programming incorporated forensic science, robotics, artificial intelligence, the music and entertainment industries, the automobile industry, and digital art production. Over the past 9 months, 15 students participated in 14 program sessions, receiving a total of 60 hours of instruction. In this time, STEM 2 THE MAX created many impactful experiences, including but not limited to:

- A DJ Music Workshop with world renowned artist Biz Markie.
- Building a mobile recording studio with the help of professional sound engineers.
- Developing a prototype of a solar wheelchair for presentation at the 25th Annual Thingamajig® Invention Convention.
- Composing, recording and producing original music and lyrics, which will debut live on the local radio station WOWD located in Takoma Park Maryland.
- Additional STEM 2 THE MAX photo and video content at albertnimley.wixsite.com/stem.

Month-by-Month Program Delivery Overview

November 2018 | Topic: Robots Save Lives – Explosive Diffusion

STEM 2 THE MAX began with an intense scenario to capture the attention of each participant and to underscore the range of STEM applications, from those that are entertaining to lifesaving. Staff led students through two sessions using Mebo 2.0 Robots to present the application of bomb disposal robots in the military. These young women and men learned how to manipulate the robots in close quarters to complete tasks that simulated the delicate maneuvers required in explosive diffusion scenarios.

January – March 2019 | Topic: The Science of Sound & Entertainment Technology

The initial plan for The Science of Sound was to hold two sessions. However, student interest in entertainment technology was great and so, staff built out multiple lesson topics and engaged outside professionals to explore how music and STEM relate. Ultimately, we delivered three additional sessions, for a total of five. The purpose of the expanded session topics was to provide a well-rounded experience that supported student's interests in composing and producing their own music. The following is a list of all the session topics that made this happen:

- The Business of Music and Modern Technology
- Intro to Camera and Lighting / Recording Software
- Intro to Soundwaves and Microphones
- The Art of Storytelling
- Music Production

Led by Nick Hewitt, an Audio Engineer and Audio Video Technician, students explored how vibration and frequency create music and got hands-on, composing, arranging, recording, editing, mixing and mastering professional quality tracks with FL Studio Software. To build their creative energy, world renowned rapper, beatboxer, DJ, actor, and comedian Biz Markie put on a DJ Music Workshop for the kids.

In preparation for recording their own music, students went beyond composing and practiced the technical aspects of setting up lighting and microphones for a live production. Students worked with professionals to build a working mobile recording studio and recorded and produced their original music and lyrics. At a date that is to be determined, these young artists will be interviewed on local radio station WOWD in Takoma Park Maryland, and their music will be debuted live on the air!



March – April 2019 | Topic: STEM 2 THE MAX Promotion and Lunch & Learn

During March and April of 2019, STEM 2 THE MAX held Lunch & Learn events for students at McKinley Technology High School. Various STEM activities were set up during their lunch periods to get a feel for the program-use of robotics, computers for coding, and the influence of art and register. This interactive approach helped raise awareness of the program and increase participation rates.

Also in April of 2019, Participants from STEM 2 THE MAX staffed a promotional table at the STEM 2 THE MAX Enrollment Fair. They showed maturity and leadership as program representatives who answered student's questions, recruited participants, and assisted families with program registration paperwork. We are proud of these students and thankful for their successful efforts that required minimal on-site support by staff.

April 2019 | Topic: STEM and the Automobile Industry

Students visited the 2019 Washington Auto show and were provided VIP tours with auto experts. Students explored the latest technology from automakers like Hyundai, Audi, Nissan and Toyota. During this session students learned about the engineering and mechanics of each car, and the technology involved in their design, manufacturing and operation. Students were given the exciting chance to drive modern electric cars as a part of the Exelon Electric Drive Experience.



May 2019 | Topic: Augmented Reality at ARTECHOUSE DC

ARTECHHOUSE DC pushed student's creativity and conceptualization of how art and technology can interact. ARTECHOUSE is "dedicated to showcasing experiential and technology driven works by artists who are forerunners of the new age in the arts and technology." This session was fodder for the mind to dream and consider ideas and aspirations that may not have been found in the walls of a traditional classroom. Students were offered an interactive experience in digital art, technology, science and creativity on large sensory installation screens, as well as new cultural and artistic experiences.

May 2019 | Topic: Introducing Artificial Intelligence

To introduce artificial intelligence in a collaborative manner, students went to Insomnia Escape Room in DC, to test their problem-solving skills with the "Oblivion" game. Oblivion is a laboratory controlled by artificial intelligence with integrated tablets, screens and virtual reality goggles. This session exemplified how A.I. interacts with and responds to people. More importantly for the purposes of positive youth development and social-emotional learning, this was a test of communication, collaboration, and problem-solving.

June 2019 | Topic: Forensic Science

The National Law Enforcement Museum provided an immersive experience for students to learn about the history, practices, challenges, successes, and current conversations in forensics and law enforcement. Students walked in the shoes of an investigator using the forensics and evidence gathering exhibits, and the decision-making training simulator, to learn how to compile evidence, decipher DNA profiles, and lift latent Fingerprints, among other techniques. Moreover, the 9–1–1 Emergency Ops Dispatch Experience exhibit put the technology that informs and coordinates lifesaving responses on display. nces.



June – July 2019 | Topic: Applying Creativity and Technology for the Common Good

In preparation for the 25th Annual Thingamajig® Invention Convention, STEM 2 THE MAX put their minds together to envision a technological solution for an everyday problem. The team designed a project focused on integrating solar powered lighting into wheelchair design to provide added safety for the user during low-light and evening hours. Together the team designed and constructed a prototype that was presented at Thingamajig. While the prototype is not built for use, the model wheelchair has functional wheels and working solar powered lighting. Further development is needed to achieve weight-bearing and lifecycle standards. However, this project is another example of the application of learned knowledge and the ambition and teamwork that is required to complete any team-based STEM or art project.

In the spirit of cultivating the next generation of STEM 2 THE MAX students and STEM professionals, current students jumped right into the activities at Thingamajig to support the children. With excitement to teach, these young women and men introduced children from across Metropolitan Washington to coding with the help of the YMCA's coding computers. This is the greater effect of STEM 2 THE MAX: the creation of a culture of appreciation for STEM that fosters continual learning and teaching.

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DECARLO HARRIS: IMMERSING YOUTH IN STEM CAREER EXPLORATION TO BUILD A CAREER MINDSET AND VISION FOR THE FUTURE

"Prior to Joining STEM 2 The Max I was interested in sports and music. My number one goal is to become a professional basketball player in the NBA. Although STEM was not my first career choice, I was given the opportunity to join the STEM Bridge Program (S2M) through Walmart and the

YMCA. I decided it would be the perfect opportunity for me to learn about the different career fields that could benefit me in the future. I learned that so much of everyday life and my interest already involves STEM! For example, I found out about the STEM behind sports and discovered career fields such as sports science. I am excited to discover that I don't have to let go of my interest to join the STEM movement happening in the world today! Many of my experiences with STEM 2 The Max gave me the opportunity to team build and help me to continue developing my collaborative working and communication skills. I made many great connections with several of the staff and program support Through the STEM Bridge Program, including meeting the CEO of the YMCA of Metropolitan Washington!"

STEVE KAPPLER, ACT ASSISTANT VICE PRESIDENT: CHOOSING THE WRONG MAJOR

"Picking the wrong major can be an expensive mistake. College students whose majors don't reflect their interests are less likely to graduate on time and more likely to drop out."

FACT: 80% of college students change their major at least once, and on average they change their major three times over the course of their college career.

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