



ENGINEERING
Community Outreach
Child & Youth Programs



Venture Academy - Engineering Youth Programs

Black Outreach STEM Series (B.O.S.S) Conference Workshop Descriptions



Kente Cloth (Gr. 7-8)

The objective of this 1.5-hour workshop is to cater to the Black student youth experience and relate STEAM concepts with cultural identity. Students should not find STEAM intimidating and should feel encouraged and seen when pursuing academic ventures. Students will be able to see how science and engineering is all around us through this math exercise when examining the shapes and patterns within traditional Kente cloths by creating their own in groups. Kente cloth, a traditional cloth worn in Ghana, is made through colours and shapes that relate to the wearer's cultural identity. This project relates to materials engineering!

Bottle Biosphere (Gr. 7-8)

In this project, Students will be asked to create a pop bottle ecosystem using empty pop bottles, water, soil, etc. The ecosystem will demonstrate how organisms within an ecosystem depend on one another to survive. This project relates to climate change and how we can impact different ecosystems. We will also plant different herbs in the soil to connect to sustainability and how we use the Earth's resources positively for our health. Due to food deserts predominantly in Black communities, there are several health issues in these communities due to the lack of healthy and affordable food options offered in neighborhood stores. We can use this project to grow our own food and demonstrate how the Earth and its natural nutrients can also have an impact on Black health!

Sports in STEM I (Gr. 9-10)

In this 1.5-hour workshop students in groups will design and build a ping pong ball launcher. Students will learn about physics and scientific principles such as projectile motion, gravity and air resistance. Students will carry out experiments outside in which they will collect their data and make observations about what launch angle results in the longest horizontal distance.

From Harvest to Home (Gr. 9-10)

In this project students will integrate key concepts relating to sustainability and structural design, focusing on Environmental & Civil engineering. They will build a Rube Goldberg Machine to represent the path food takes from harvest to our home. Students will receive 10 marbles to represent food. The goal of the activity is to not have any marbles fall out of their contraption, as the fallen marbles represent food waste. Students will learn about the UN's SDG #12 – Responsible Consumption and Production (with a key emphasis on reducing food waste), sustainability, and structural design. This project relates to the “Zero-Waste” culture that is rooted in Black communities to curb resources that are lost such as money, land and energy, as food waste causes and exacerbates existing social inequalities.

Curly Hair Series Pt. 2 - Product pH (Gr. 7-10)

The objective of this 1-hour workshop is to cater to the Black student youth experience and focus STEM concepts regarding the unique qualities of Black hair. Students will learn about evolutionary traits that are favourable according to the environment, as well as key scientific principles such as pH and temperature. Students will be able to test the different pH's of hair products made specifically for curly hair and find out what works best for them.

Curly Hair Series Pt. 3 - Leave-in Conditioner (Gr. 7-10)

During this engaging workshop, students will actively participate in a hands-on, lab-based experience lasting one hour. They will have the opportunity to apply chemistry principles to craft their own leave-in conditioner, gaining practical knowledge on how to maintain the health and hydration of their hair. By blending scientific understanding with practical application, participants will not only deepen their understanding of STEM concepts but also acquire valuable skills for personal care and well-being. This workshop serves as a platform for empowerment, education, and celebration of the unique attributes of Black hair within the context of science and self-care.

Static Sensors (Gr. 7-10)

In this circuitry project, students will construct a circuit that utilizes a different form of electricity – static electricity. Students will construct a circuit that will only be completed when sources are charged (statically) and brought close to the circuit. This project will inspire the students to learn about Engineering Physics, Electrical Engineering, and Mechatronics Engineering.

Soft Matter Physics Power Hour (Gr. 7-10)

This workshop offers hands-on activities where students explore key physics concepts while making slime, bouncy balls, and toothpaste. At Station 1, students dive into polymer science by creating slime. They'll see how changing ingredient ratios affects slime's thickness (viscosity) and learn about its stretchy (elastic) properties. They'll also find out that slime behaves differently from water—it's a non-Newtonian fluid! Station 2 turns students into material scientists as they design bouncy balls. They'll learn how material structure affects bounce (elasticity) and discover the science behind how energy is stored and released during bouncing. In Station 3, students become materials engineers by formulating their own toothpaste. They'll see how adding ingredients changes toothpaste thickness and learn about its response to squeezing and spreading. A trend we have noticed is that Black students are less likely to take physics in high school, leading to less Black students in engineering as they are missing that class from their pre-requisites! We aim to start to introduce Black students to physics in a way that is fun and makes it comfortable for them!