

Booleen Girl Annual Report 2023



Mission

The mission of Boolean Girl is to improve diversity in STEM fields by engaging underrepresented youth including girls in grades three through eight with meaningful, hands-on instruction and sustained exposure to computer science and engineering in a collaborative and welcoming environment.

As career fields like computer engineering, artificial intelligence, and robotics grow in importance, we must better prepare girls and women to take on leadership roles in these fields. That starts with fostering inclusive, creative, and collaborative environments in which girls can learn and grow confidence in STEM subjects at a pace equal to that of their male peers. Girls and young women have a hard time picturing themselves in STEM roles. They need more exposure to STEM jobs, female role models, and career awareness and planning. That's where Boolean Girl comes in.

At Boolean Girl, we work to diversify STEM (science, technology, engineering and math) by teaching and inspiring girls, under-represented groups and low-income kids to code, build, invent and animate. We provide girls-only and co-ed classes, camps and online education, teaching coding and engineering in an inclusive, welcoming environment. With a robust curriculum and hands-on projects, we educate and empower the next generation of technologists.

"I loved how everyone was helpful and kind... everything was amazing, I am looking forward to my next class."

-Fiorella (student)

Our Story

We are parents and engineers, educators and nonprofit leaders. We founded Boolean Girl in 2014 to develop and foster an interest in coding and engineering among elementary-aged girls. While there are tech programs for girls over 14, there are few that cultivate early and sustained interest in coding and engineering. Boolean Girl does. In addition, we have expanded our reach into underserved and lower-income communities to provide access to STEM opportunities for elementary and middle-school age children to further our mission to truly diversify STEM.

Our goal is to build an inclusive STEM community by inspiring underrepresented kids to code with early engagement and continued programming, thereby helping the next generation of coders and engineers grow in confidence as they get older and pursue careers in these vital fields.

How's it Going?

We started our journey teaching 49 girls in one elementary school in Arlington. We have now reached over 34,700 girls and underrepresented youth throughout the greater Washington, DC area, in addition to online students across the country.

In 2023, we had great success getting into schools with our "micro:bit for All" program and after-school Clubhouses. We're seeing new students in our targeted communities discovering that they can have fun with and be good at computer science and engineering. Now we need to provide additional after-school programs for students who are really inspired and want to do more. They need a place to go, and our goal is to provide that for students who wish to continue their STEM pursuits.

We have now proven our concept and our curriculum. While we will be returning to a more regional focus in 2024, we will be working to package up our programs to empower teachers and advocates in other areas to build their own Boolean Girl communities.

"It is interactive, fun, and the perfect way to introduce coding to the kids. The instructor was great with the students, and my daughter learned so much."

-Julie (parent)



2023 Highlights

570



Participated in a Clubhouse

11

Ambassadors

51

Instructors

227

Individual donors



63

Schools

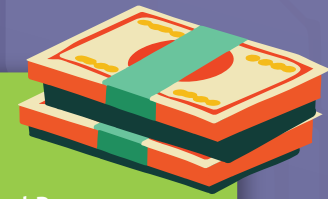
Revenue

\$272,168

Earned Revenue

\$296,740

Direct Public Support



Expenses

\$9,582

General Operations

\$476,569

Programs

\$15,281

Fundraising

566



Participated in an Hour of Code

652



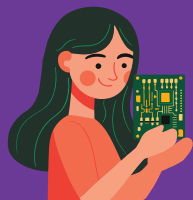
Attended a Summer Camp

GEICO Grant: General donation to support micro:bit for All in Montgomery Co

Alice and Eugene Ford Grant: STEM programs in DC including DCPS Arts Build Day

2,773

micro:bit kits delivered to schools



10,297

Kids reached in 2023 +53% from last year!



Community Foundation for Northern Virginia Business Women's Giving Circle Grant

Amazon Grant: supporting micro:bit for All in Alexandria and Clubhouse at low income housing

Northern VA Magazine: 2023 Best Summer Camp (since 2018)

Glenn W Bailey Grant: DC Clubhouses at Title 1 schools, mostly in Wards 7 and 8.

Battelle - micro:bit for All in Fairfax County Public Schools reaching hundreds of elementary school students at Title 1 schools.



Our Programs

Clubhouse

Clubhouses deliver hands-on instructions across a wide range of STEM topics for all levels of skill and experience. We run Fall and Winter Clubhouses on Saturdays and are working with teachers to expand Clubhouse to after-school programs.

Summer Camp

Girls age 7+ learn computer science and engineering fundamentals through a series of unique projects and hands-on challenges. Our students learn coding, robotics, AI, engineering, teamwork, and digital citizenship.

Micro:bit for All

We work with the Virginia Tech Thinkabit Labs K-20 STEM Education and Workforce Development Programs, along with school districts in our communities, to get a micro:bit kit in the hands of every 5th grader in the DMV (District of Columbia, Maryland, Virginia).

Hour of Code

These online coding events are sponsored by corporations, community organizations, and other entities to jumpstart a girl's interest in computer programming.

Boolean University

This free resource provides over 25 courses at different levels inspired by our other programs to help kids code and engineer on their own.

Scholarships

We offer full scholarships for any students who cannot afford to pay for Clubhouse. We also offer scholarships for our after-school programs in Title 1 schools.

Curriculum for Schools

We are pioneering new integrated curriculum in Washington, DC and Alexandria, VA schools, working with the District of Columbia Public Schools and Alexandria City Public Schools, respectively.

Ambassadors

Boolean Girl STEM Ambassador events show girls what kind of jobs they could have, featuring successful women who have helped pave the paths for future generations.

Student-Teachers

We provide leadership opportunities to girls who graduate from our programs or other STEM programs and want to work for us as instructors.

Girl Scouts

Our programs are always free for Girl Scouts. We offer certificates for completion of the Coding Basics badge following Clubhouse classes. Troops are welcome!



The Importance of After-School Programs (Like Clubhouse!)

Learning is not just done in the classroom in between bells. According to data from Million Girls Moonshot, a movement of STEM Next Opportunity Fund, from the time they begin elementary school until they graduate high school, more than 80% of children's time is spent learning outside of school.¹ Whether they are participating in after-school programs or summer camps, or learning at museums, libraries, in their communities, or at home, learning is constant and vital to spur on educational ambitions.



Girls who participate in STEM clubs and activities outside of school are more likely to say they will pursue STEM subjects later in their education.²



54%

More likely to take Computer Sciences classes.

190%

More likely to choose Engineering classes.



Students report that participation in a STEM after-school program positively impacts:³

80%

Exploration

Students reported their STEM career knowledge increases by 80%.

78%

Inspiration

78% of students reported a more positive attitude about STEM.

72%

Skill-Building

Students said their perseverance & critical thinking increased by 72%.

73%

Belonging

73% of students reported a more positive STEM identity.

The Income Factor

By the sixth grade, kids from middle-income households spend 6,000 more hours in after-school and summer learning programs than their low-income peers.⁴ We have expanded our mission to include low-income and other underserved groups to help address this disparity.

20% of our students this past year came from low income households and have received scholarships to Boolean Girl.

75% of our partner schools are Title 1 status.

● Title 1 School ● Non-Title 1 School

DCPS:

- Barnard
- Beers
- Boone
- Brent
- Brightwood
- Bruce-Monroe
- Burroughs
- Burrville
- Cleveland
- Drew
- Eaton
- Excel Academy
- Garrison
- Hart Middle
- H.D. Cooke
- Houston
- Ida B. Wells
- J.O. Wilson
- Janney
- John Lewis
- Key
- King
- Langley
- LaSalle-Backus
- Leckie
- Ludlow-Taylor
- Malcolm X
- Mann
- Marie Reed
- Maury
- McKinley
- Miner
- Moten
- Oyster-Adams
- Payne
- Randle Highlands

● Raymond

- Ross
- School Without Walls @ Francis-Stevens
- School-Within-School @ Goding
- Seaton
- Smothers
- Stanton
- Takoma
- Thomson
- Walker-Jones
- Whitlock (formerly Aiton)

Montgomery County

- Burnt Mills
- Greencastle
- Paint Branch HS
- Springbrook HS

Alexandria Schools:

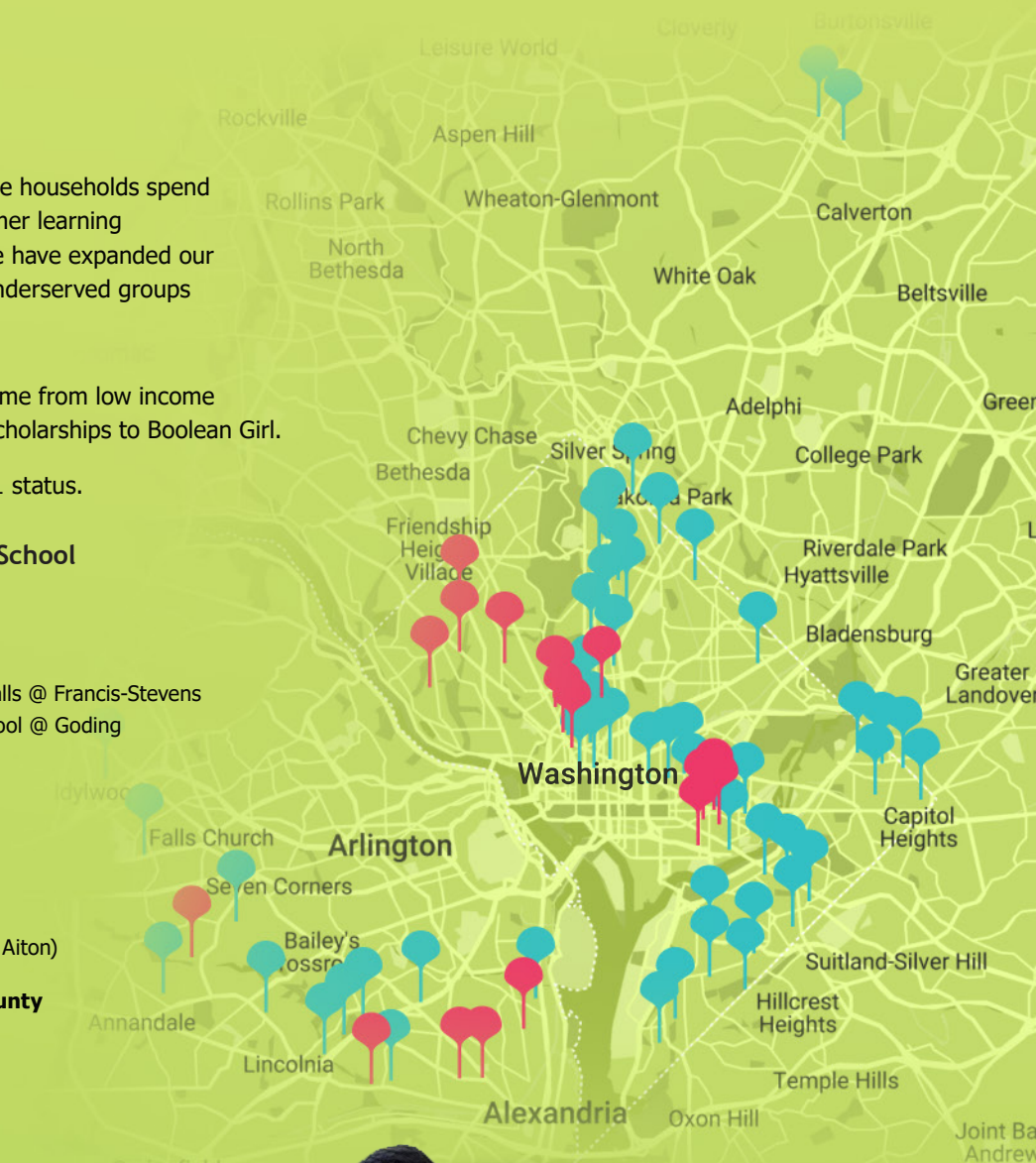
- Charles Barrett
- Cora Kelly
- Douglas MacArthur
- Ferdinand T. Day
- James K. Polk
- John Adams
- Lyles-Crouch
- Mount Vernon
- William Ramsay

Arlington:

- Abingdon

FairFax:

- Beech Tree
- Dogwood
- Mason Crest
- Parklawn
- Sleepy Hollow
- Timber Lane



1. Million Girls Moonshot, "Approach."

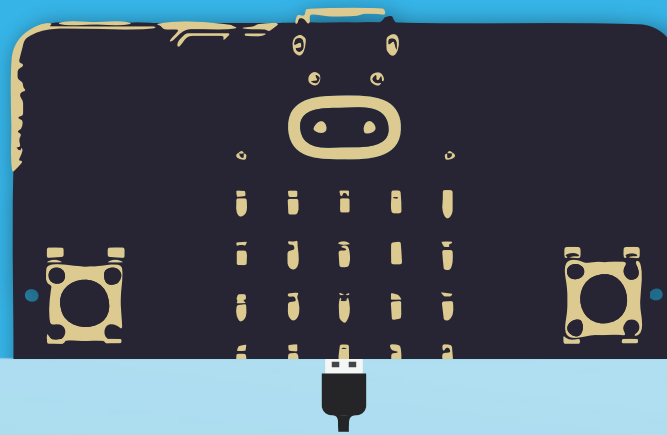
2. Microsoft, "Closing the STEM Gap."

3. STEM Next, "STEM in Afterschool and Summer Works."

4. Ottinger and Washington, "STEM Next."

micro:bit for All

We work with the Virginia Tech Thinkabit Labs K-20 STEM Education and Workforce Development Programs, along with school districts in our communities, to get a micro:bit kit in the hands of every 5th grader in the DMV (District of Columbia, Maryland, Virginia).



The goal of our micro:bit for All program is to get a micro:bit kit in the hands of every 5th grader in the DMV to spark an interest in technology, computer science and engineering. Starting in school then at home, young learners get hands-on experience and make a connection between abstract ideas of coding and real world outcomes in hardware. Students work with hardware and software together to design, build, and prototype physical gadgets. They work to iteratively improve their gadget, along the way making and learning as they create.

Base kits are distributed to schools. Schools that can afford them might purchase them, at cost. Other schools will receive them as part of a grant or donation from corporations, individuals, and foundations that support STEM education for younger learners.

Once kits are received by the schools, teachers can use them in a wide variety of subject-area activities and experiences across all grades. After using them in school, fifth-grade students take them home and keep coding and building. Next year, new kits are provided to the school.

Beginning in December (and continuing in 2024), we worked with Montgomery County Public Schools to expand our micro:bit for All program.

Springbrook High School students and the head Computer Science teacher traveled to Burnt Mills Elementary School to lead four classrooms of 5th grade students through a series of projects with a micro:bit. The students made dice, rock paper scissors games, and a variety of other projects, learning from the Springbrook students while teachers from Burnt Mills joined in on the fun. We pioneered this program with Springbrook High School, then extended it to work with students at Paint Branch High School as well.

This event was made possible through a generous donation from **GEICO**. With this donation we were not only able to coordinate this event - including the time to train teachers and high school students - but also to give every student that participated (high school and elementary school) a micro:bit Base Kit to take home with them. In 2023, we gave 900+ micro:bit kits to 5th grade students at Title 1 schools in Montgomery County including: Brooke Grove Elementary, Burnt Mills Elementary, Cannon Road Elementary, Cresthaven Elementary, Drew Elementary, Galway Elementary, Greencastle Elementary.



New Barcroft Clubhouse



With funding from our partner, **Amazon**, we brought Clubhouse on the road with Saturday morning sessions at Barcroft Apartments, Section 8 affordable housing in Arlington County. Through this program, we are bringing STEM education directly to low-income and underrepresented children, many of whom have limited access to after-school and weekend programs. We hope by bringing Boolean Girl to low-income residences such as Barcroft Apartments, we will drive greater awareness to this free (thanks to Amazon!) program and build an interest in and passion for coding and engineering in children who often do not get the opportunities in STEM that those without financial difficulties in their age groups receive.

"I like how I get to choose my own characters."
-Melissa (student)

"I love that in 1 short hour my daughter learned the basics and her knowledge prior to that was zero."
-Mirjana (parent)



The Gender Gap

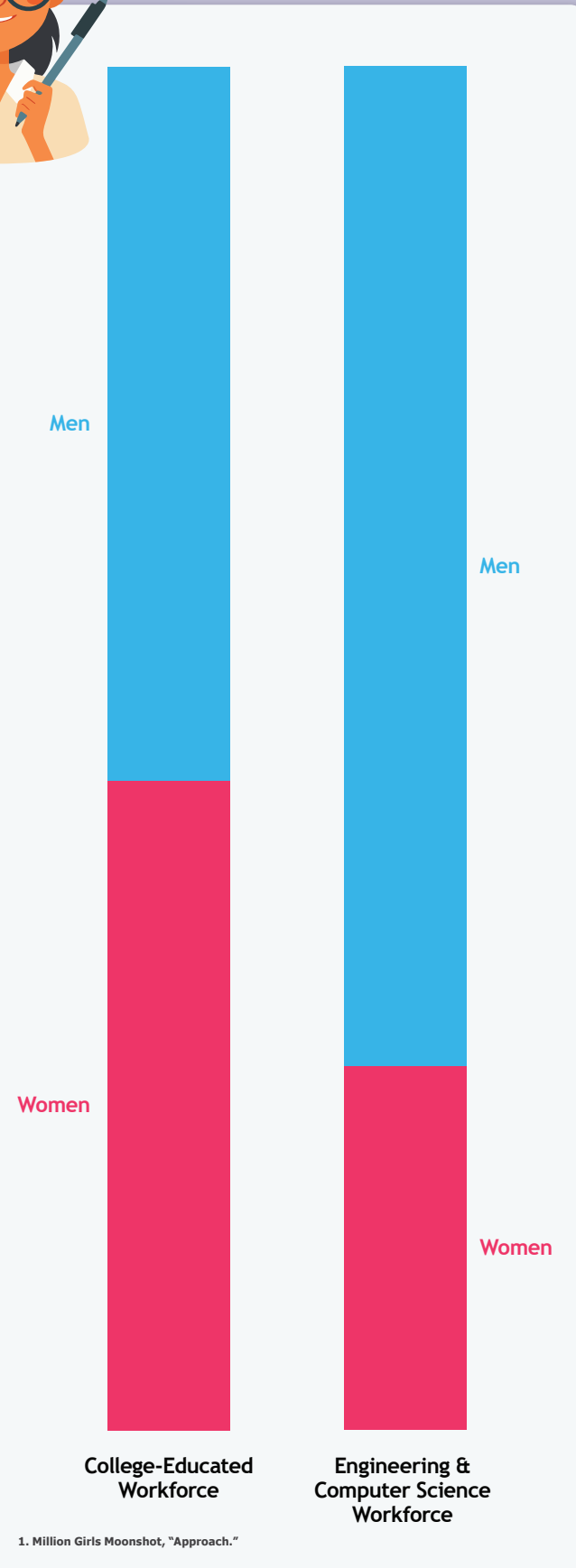
Women make up half of the total U.S. college-educated workforce, but less than **one third** of the science and engineering workforce.¹

Latinx and African-American women make up less than **3%**.

The gender gap among Gen Z men and women pursuing careers in engineering and computer science is **28%**.

Women in STEM have an especially low concentration in engineering (**15%**) and computer and mathematical sciences (**25%**).

We created Boolean Girl in 2014 to help address this issue. Throughout the years of working directly with girls and young women with an interest in computer science and engineering, we gathered feedback from our students, parents, and teachers to better develop programs. This year, we combined that qualitative data with an external survey conducted by The Million Girls Moonshot to help uncover key ways to combat the declining trend of women in STEM fields.



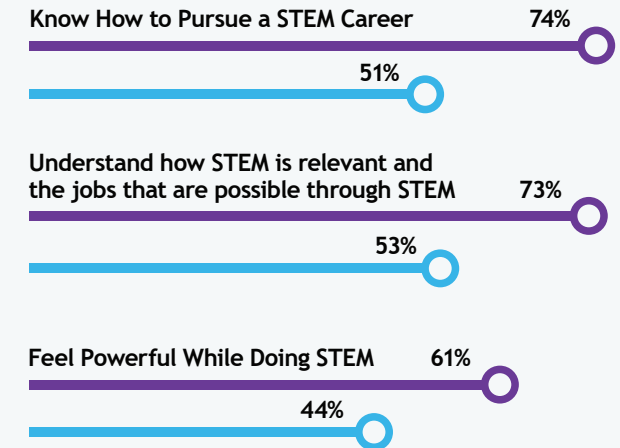
Representation Matters

We know representation is important to help children see what's possible. We hire female instructors – often girls in our communities and former campers who have gone on to pursue STEM subjects in high school and college. These instructors are also close in age to the students and may have even gone to their schools, providing relatable role models and mentors for the elementary students.



What is the Impact of Female Role Models? (Girls, Grades 5-12)²

- Girls who DO know a woman in STEM
- Girls who do NOT know a woman in STEM



2. Microsoft, "Closing the STEM Gap."

Ambassadors

This past year, we had 12 STEM Ambassador events with 11 different female leaders across many STEM fields.

- Sejal Amin:** Chief Technology Officer at Shutterstock
- Isadora Rocha:** Director, Web & Mobile Engineering at Starbucks
- Michelle Chen:** Software Systems Engineer at Johns Hopkins University Applied Physics Laboratory.
- Elizabeth Dietrich:** Research Associate, Johns Hopkins University Applied Physics Laboratory
- Laurissa Neuwirth:** Engineering Manager at Expel / Google Women Techmakers Ambassador
- Marguerite Toscano:** Coastal Geologist at the Smithsonian
- Nanci Schmizzi:** IT Executive/Technology Strategist/STEM Advocate
- Gayathri Dowling:** Director, Adolescent Brain Cognitive Development (ABCD) Project at The National Institute on Drug Abuse (NIDA)
- Nikki McDonald:** Financial Advisor
- Breyonna Bailey:** Lead Spacecraft Systems Engineer at Boeing
- Gretchen Hein:** Environmental Engineer and Professor at Michigan Technological University

"Challenging, relevant, fun. Makes her think (and she's a smart girl!). She comes home so energized."
-Lauren (parent)



Thank You to Our Sponsors and Partners

When you support Boolean Girl, you transform the lives of the thousands of participants in our online and in-person programs. We are tremendously grateful for the support and hard work of all of our partners. They provide a diverse range of support to our mission, including:

- Financial support
- Providing space for events
- Volunteers
- Technical support and resources
- Guidance



Boolean Girl Board



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Co-Founder



Sarah Eastman
Co-Founder



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Maria Izurieta



Cathy Burton



Zoe Kant



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Our Sponsors

Each of these organizations contributes to further the Boolean Girl mission.



Strategic Partners





Designed by Oskar Shambaugh



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