STRENGTHENING THE STEM PIPELINE: THE IMPACT OF THE STAR INITIATIVE

2018-2024





SUPPORTING STUDENTS IN STEM

transforming and advancing representation

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STAR SUPPORTS UNDERSERVED YOUTH TO INCREASE OPPORTUNITIES AND OUTCOMES

Greater Boston is a global biotech hub with a rapidly growing demand for STEM (Science, Technology, Engineering & Math) talent. However, students from under-resourced communities — particularly Black and Latinx students—are disproportionately underexposed to and underprepared for these career opportunities.Thus the STAR Initiative was launched in 2018 to address these challenges.

STAR brought together two public school districts (Cambridge and Somerville, MA) and a team of non-profit organizations to form a coalition with similar goals and committed funding for six years. These districts and organizations met regularly to discuss solutions and best practices around engaging underrepresented youth to develop and sustain their interest in STEM. STAR created an ecosystem of support that fostered long-term engagement with STEM, addressed critical gaps in education and workforce diversity, and equipped students with the skills and exposure needed to thrive in Greater Boston's biotech sector.

Because of STAR's committed long-term funding, grantee organizations increased the number of students and schools they served, deepened and expanded programs, and helped hundreds of educators engage students in STEM subjects more successfully. **STAR's collective action and longitudinal approach to advancing STEM education equity has resulted in positive outcomes for youth including increased passing rates in 9th grade STEM classes and enrollment in honors STEM classes.**

THE PROBLEM

LACK OF ACCESS AND OPPORTUNITY

Historically underserved youth, including students of color and those from economically disadvantaged backgrounds, often lack exposure and enrichment opportunities in STEM, limiting their career prospects.

LACK OF DIVERSITY

The STEM workforce remains predominantly white and male, with significant racial and gender disparities, limiting innovation and representation in these critical fields.

THE STRATEGY

+ BUILDING AN STEM ECOSYSTEM

The STAR initiative unites school districts, nonprofits, and educators in a coordinated effort to deliver STEM learning both in and out of the classroom, creating a strong support network focused on the needs of underserved and underrepresented youth.

FOCUSING ON GRADES 6-16

By reaching students in their formative years, STAR provides essential STEM exposure and equips them with the skills and confidence needed to pursue, succeed, and persist in STEM pathways.

DISPARITY
AMONGST
CAMBRIDGE
& SOMERVILLE
STUDENTS

BEGINS EARLY

In Cambridge, only 33% of Black and 15% of Latinx 8th graders meet math expectations, compared to 53% of White peers.

In Somerville, just 31% of Black and 12% of Latinx 8th graders meet math expectations, compared to 56% of White peers. The lack of diversity isn't just a social issue—it's an economic one.

10.7%

STEM nationwide job growth projection between 2020 & 2030

40%

Massachussets STEM job total employment growth projections for 2028 2

HOME

STAR ENABLED MORE STUDENTS TO PASS FOUNDATIONAL SCIENCE CLASSES AND ENROLL IN ADVANCED STEM CLASSES

Figure 1: Data analysis reveals that students who identified as Black and English Language Learners (ELL) and are enrolled in the STAR programs in both Cambridge and Somerville have achieved a significantly higher (*p-value < 0.05) passing rate in their 9th grade science courses compared to their peers from similar social identity backgrounds. This increased pass rate not only ensures these students are on track for graduation but also maintains their eligibility for more advanced STEM courses.

Figure 2: Cambridge and Somerville students participating in STAR who are Black, Latinx and low income chose to take honors levels of Geometry, Algebra II, Chemistry and Biology at a statistically greater rate (*p-value < 0.05) than their non-STAR peers from similar social identity backgrounds. Deciding to enroll in an honors level STEM class sets students up to be college and career ready.



THE STAR INITIATIVE BY THE NUMBERS

STAR brought together two public school districts (Cambridge and Somerville, MA) and a team of non-profit organizations to form a coalition dedicated to serving historically underrepresented youth in STEM (Science, Technology, Engineering & Math) primarily in grades 6-16, along with educators, all with the goal of diversifying the STEM workforce pipeline. STAR's collective action and longitudinal approach to advancing STEM education equity has resulted in positive outcomes for youth.



Numbers represent cumulative over the past 6 years.

THE STAR ECOSYSTEM STAR GRANTEE ORGANIZATIONS



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Breakthrough Greater Boston (BTGB) prepares low-income students for college success and life through a unique Students Teaching Students model.



Enroot empowers immigrant youth to achieve academic, career, and personal success through mentorship, academic coaching, leadership development, job readiness training, and social-emotional support.



The Young People's Project (YPP) fosters math literacy among marginalized students, empowering them with essential skills for academic and life success.

Lesley STEAM Learning Lab researches new learning opportunities through engagement and inquiry-based exploration, while introducing culturally responsive STEAM pedagogies.



uAspire (*STAR involvement 2018-2023*) supports high school and college students to access financial aid and navigate postsecondary systems through in-person and virtual advising.



Citizen Schools (*STAR involvement 2018-2022*) empowers schools, districts, and communities to work together to create and sustain authentic experience-based learning opportunities.







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CHARTING OUR COURSE HIGHLIGHTS FROM 2018 TO TODAY

January 2018

Biogen Foundation launched STAR

June 2018

STAR nonprofit grantees selected

September 2018

STAR nonprofits and school districts came together for the first of many **monthly** liaison meetings to discuss areas of collective action

May 2019

Showcase Summit Youth-led grantee tables with participation by school districts and **Biogen Foundation**

School Year 2019-20

Enroot and Lesley STEAM Learning Lab piloted Math **Circles** for English Language Learners at Somerville HS

School Year 2019-20

YPP partnered with Citizen Schools to launch Flagway at Argenziano School

July & August 2020

Lesley STEAM Learning Lab offered three 1-credit **courses** on remote teaching to 250+ educators

Fall 2020

2020

Biogen Foundation funded district-embedded Data Specialists to connect non-profits to student outcomes

School Year 2020-21

SPS along with Citizen Schools, BTGB, and YPP launched Youth Math Ambassadors to advocate for equity in math level placement

July 2021 & 23

Lesley STEAM Learning Lab collaborated to create a pre-college course at Somerville HS, which blends art, AI, and robotics and integrates STEAM and **CTE** standards

July 2022

Lesley STEAM Learning Lab facilitated the first of three yearly cross-district math teacher institutes with Concentric Math, sparking interest in complex instruction with an equity focus

December 2022

The Biogen Foundation STAR Initiative & CPS Impact white paper was published highlighting the effect of the district-embedded Data Specialists

Fall 2023

Somerville HS and Lesley STEAM Learning Lab co-developed an **AP** Computer Science **Principles course**

STANDOUT QUALITIES SETTING APART THE STAR INITIATIVE

"The STAR Initiative has afforded us unprecedented access and opportunity to work directly with public school educators and out-of-school time providers. While we have had a long history of working with these educators, this work provided us with a focused, multi-faceted, and long-term opportunity to nurture the development of a robust STEM professional learning community. By developing this professional learning community, we are helping to support a more coherent, equitable, and studentcentered STEM/STEAM learning ecology for youth in Cambridge and Somerville."

- SUE CUSACK Director Lesley STEAM Learning Lab

The STAR initiative is unique within the national landscape of STEM education because of the following five characteristics:



Photo: Cambridge School District partipants at the Young People's Project National Flagway Tournemant

Unified Focus on a Shared Student Population:

All STAR grantees operate within the out-of-school-time space, and in some cases during the school day, serving the same pool of underserved and underrepresented students from the Cambridge and Somerville Public Schools. This shared focus fosters collaboration, facilitating the exchange of ideas and the development of innovative solutions to address the specific needs of this demographic.

Active Engagement of Two Distinct School Districts: The Cambridge and Somerville Public School Districts are integral partners of STAR since its inception. Thought leaders from both districts play an active role in STAR.

3 Well-Established Grantee Organizations: STAR selected nonprofit organizations with a proven track record of deeply engaging with youth and fostering enduring relationships within the communities of Cambridge and Somerville. These grantees bring extensive experience and expertise.

Close Geographic Proximity: All STAR grantees,
stakeholders, and abundant local assets, such as
renowned universities, research institutes, a biotech hub,
and tech companies are situated within a five-mile radius.

In-District Data Specialists: STAR funds two indistrict data specialists to assess impact and support grantees. With unparalleled access to school-based data, they collaborate to analyze student demographics, performance metrics, and course enrollments to ensure alignment with target populations and provide insights into academic progress and STEM engagement. They also share aggregate data with non-profit partners who would not normally have access to such data, enabling them to make data-driven decisions to enhance student outcomes.

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CROSS-DISTRICT EQUITY IN EDUCATION

The Lesley STEAM Learning Lab began collaborating with Somerville Public Schools in 2021 to cultivate a "maker mindset" among educators and students through hands-on problem-solving and emphasized developing a strong foundation in science and mathematics.

A similar initiative in Cambridge led to the Lesley STEAM Learning Lab creating a unique cross-district professional learning retreat in July 2022. This retreat, in partnership with **Concentric Math**, brought together math educators from both districts, providing them with professional credits while focusing on Complex Instruction—an inclusive pedagogy that addresses power dynamics, privilege, and focuses on group activities.

The retreat and subsequent efforts emphasized principles of social justice, equity, and culturally responsive teaching in math education. This commitment continued with additional crossdistrict retreats in the summers of 2023 and 2024, and expanding to include science education.

During the academic years, this important work continued. The Lesley STEAM Learning Lab and collaborators worked to build leadership capacity among Cambridge teachers in Complex Instruction while supporting the implementation of the new



Photo: Cambridge Youth Program staff participating in a professional development activity led by Lesley University

Illustrative Mathematics (IM) curriculum for grades 6-8, Algebra 1 & 2, and Geometry. Simultaneously, Somerville continued collaborating with the Lesley STEAM Learning Lab to offer workshops for middle school math and science educators, focusing on their specific content areas while reinforcing Complex Instruction and the IM curriculum. The Lesley STEAM Learning Lab has been an anchor for curriculum support and team development with grade 6-8 science educators, catalyzing a comprehensive curriculum review cycle poised to bring significant improvements. "In tandem with curriculum support, Lesley also helped lead a math equity revamp bringing together experts and SPS stakeholders to review and understand our own practices that may have been contributing to inequitable outcomes. What emerged was a clear focus on complex instruction, a way to equitably differentiate in classrooms."

- SOMERVILLE PUBLIC SCHOOLS ADMINISTRATION

"I really appreciated getting to work with teachers from other districts and grade levels. I was really curious about the perspective from middle school teachers [about the level of challenge in MS math]. I appreciated hearing the perspective of the Somerville teachers, too. It brought me joy to be in a room full of smart, thoughtful and changeminded educators."

> - CAMBRIDGE PUBLIC SCHOOLS HIGH SCHOOL MATH EDUCATOR

STAR HAS STRENGTHENED RELATIONSHIPS



Photo: Students participate in STEAM It Up

Over the last six years, STAR has greatly improved relationships between the Cambridge and Somerville public school districts and the STAR grantees. Regular meetings have facilitated a strong mutual sharing of information and data, ensuring alignment with district priorities and keeping everyone up to date on each other's work. These interactions have built deeper connections and increased collaborative efforts, fostering a stronger, more unified approach to STEM education for underrepresented youth.

Engaging Young Minds through STEAM Activities: In October 2023, the Cambridge STEAM Initiative hosted "STEAM It Up," an annual event that unites students, families, and community partners for hands-on STEAM activities. More than just an event, "STEAM It Up" underscores the power of community collaboration in nurturing a passion for STEAM. As they have in past years, Lesley STEAM Learning Lab contributed with a child-friendly circuit and arts activity, while Math Literacy Workers (MLWs) from YPP engaged attendees in math-based learning. This partnership highlights the collaborative spirit fostered by STAR, driving STEAM education success in Cambridge.

Enhancing Equity in Mathematics Education: In 2020-2021, Somerville Public Schools, in collaboration with YPP, BTGB, and Citizen Schools, launched the 'Math Ambassadors' program in response to student feedback. Students noticed disparities between 8th grade math performance and 9th grade math placement. Middle and high schoolers met weekly to discuss equity in mathematics, examining class placement data and failure rates. Students also collaborated with math educators and administrators to address bias and racism, encouraging innovative and equitable solutions. The project aimed to empower students by ensuring their active participation in district-level decision-making processes.

Enroot Youth Dive into Data with Math Circles Initiative:

In 2020, Enroot partnered with the Lesley STEAM Learning Lab to create "Math Circles," a set of engaging activities focused on analyzing data in the media for Enroot immigrant youth. This collaboration enhanced students' understanding of data representation and its impact on public perception and is a testament to the power of collaboration, providing valuable learning experiences that equip students with essential skills in data analysis and critical thinking.

STAR PARTNER Spotlights

"STAR has offered an opportunity for multiple organizations that serve the same populations of students to gather, build relationships, and partner across typically siloed programming. "

-SHARLENE YANG, Director Cambridge STEAM Initiative



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Photo: Breakthrough Greater Boston Student Participants

94%

College

Rate

Admission

Breakthrough Greater Boston (BTGB) prepares underserved students for college success and trains college students to become the next generation of urban teachers. BTGB has provided opportunities for over 3,000 students and aspiring teachers. In recent years, BTGB has a 94% college admission rate for graduating seniors, with >82% persisting, far exceeding the national rate of 14% for low-income students.

Through intensive out-of-school programming from 7th grade to completion of college, BTGB changes students' academic trajectories and supports them along the path to and through college. Simultaneously, the teacher training program for college-aged students includes competitive national recruitment, research-based training, and daily coaching from master teachers. BTGB's unique "students teaching students" model inspires college students to become urban educators and students to become college graduates.

HIGHLIGHTS

Training the next generation of STEM teachers:

- STEM Teaching Fellows gain over 500 hours of training, mentoring and classroom experience.
- Over 75% of BTGB's Teaching Fellows go on to pursue careers in education, thereby addressing the urgent need for STEM educators.
- Over 60% of BTGB teachers are of color versus 17% of public school teachers nation-wide

Preparing low-income students for success:

- Students receive over 100 hours of STEM learning and 50 hours of career exploration annually.
- Three hundred 7th-9th grade students participate in the Full STEAM Ahead program, which provides hands-on workshops and field trips to prepare middle school students to take on rigorous Honors and AP courses in high school, as prerequisites for future STEM careers.
- 89% of 2024 graduating seniors in Cambridge and Somerville will be attending 2-year, 4-year or trade school.

Students served and aspiring teachers were supported

BTGB maintains a unique data-sharing agreement with both the Somerville and Cambridge school districts that allows BTGB to track and support student progress throughout the year.

AMRIN'S JOURNEY: FROM UNCERTAINTY TO SUCCESS



Photo: Amrin, BTBG student, proudly addressed the audience at the annual BTGB Gala in 2024

Amrin, a 12th-grade student at Cambridge Rindge and Latin, proudly addressed the audience at the annual Breakthrough Greater Boston (BTGB) Gala on May 1, 2024. "I'm thrilled to announce that I will be attending Northeastern next year, and I couldn't have done it without BTGB and its amazing staff," she began.

Her journey with BTGB started the summer before 7th grade. She remembered being greeted by a community of passionate young educators that created a summer camp vibe, but also ensured that she was engaging in constant learning.

Preparing to pursue a STEM major, Amrin revealed, "I hate math. Well, more like hated." Math had always made her feel unintelligent because it required proof, not just arguments. This changed thanks to Tanisha, a Teaching Fellow and former BTGB student, who helped her see math differently by emphasizing understanding the basics rather than just memorizing solutions. "Though she probably doesn't know this, I really appreciate her for helping me get over my hatred of math," Amrin said.

Amrin's story is deeply connected to her family's journey. Her immigrant parents from Bangladesh faced significant challenges. Her father worked tirelessly, while her educated mother was undervalued. They strove to raise a child in an unfamiliar world. "Many of my peers have parents who are professors or teachers, but my parents didn't have that background," Amrin explained. "This made subjects like math difficult for me, as many teachers failed to realize the educational supports some of us didn't receive at home." BTGB became a beacon for Amrin, providing the tools to learn and leveling the playing field with her classmates. She addressed a common misconception: "Some people may say Cambridge doesn't need support for its students because of our numerous opportunities, but they don't realize the severe polarization between high-income and low-income families." Looking forward to her college journey, she expressed her gratitude and confidence. "BTGB bridges the gap between students who have many resources and those who don't, setting them up for future success. I am living evidence of that, and with BTGB's help, I will not be the last."

> "BTGB bridges the gap between students who have many resources and those who don't, setting them up for future success. I am living evidence of that, and with BTGB's help, I will not be the last."

> > — AMRIN BTBG Student

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IMPACT REPORT 2018 - 2024

enroot



Photo: Enroot students during Career Fair month

of Enroot's students will be the first generation to attend college



graduate college compared to peers

Enroot empowers immigrant youth to achieve academic, career, and personal success through inspiring out-of-school experiences. Enroot serves high school and college English Learner and Former English Learner students in Cambridge, Somerville, and on 16+ college campuses.

Enroot's four to eight year wraparound model provides mentorship, academic coaching, leadership development, job readiness training, post-secondary preparation and access, college success support, STEM exposure, and social-emotional support. These services ensure that each student receives tailored support to meet their unique needs while narrowing the opportunity gap between immigrant students and native English speakers. The mentoring model advances their mission by allowing students to practice their English language skills, build community, develop cultural identity, excel in academics, and set life goals with a dedicated adult.

In the 2023-2024 school year students interacted with over 56 STEM professionals through STEM activities and events, including "Lunch and Learns", seminars, career fairs, visits to STEM companies and STEM internships.

HIGHLIGHTS

Connecting with Mentors:

In the 2023-2024 school year, Enroot students interacted with over 90 volunteer mentors. Trained volunteer mentors meet weekly with Enroot students playing a crucial role in the personal and professional development of their mentees; they serve as role models, help build a networks, career development, among other roles. An effort is made to recruit mentors who speak students' first language, are immigrants themselves, and/or are in a professional field that is of interest to our students.

Redefining Career Fairs :

Enroot's Career Fair Month in April allows students to connect with community members and explore various career paths. Unlike traditional career fairs, this event features hands-on activities, including panels on STEM careers, entrepreneurship, and trades, as well as workshops on brand development, interview confidence, and 1:1 resume support. Partners bring interactive activities to enrich students' understanding and skills for their future careers.

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CELEBRATING STAR STUDENT SUCCESS OVER THE YEARS

STAR continues to nurture student excellence through diverse, hands-on learning experiences. Outlined are two such stories, out of the many inspiring student stories, which showcase STAR's transformative impact and its commitment to fostering creativity, collaboration, and academic growth among students.



Photos: Enroot scholars excel in the FIRST Robotics Competition "Piece of the Pi(e)" game developed by students





Enroot Scholars Excel in the FIRST Robotics Competition:

Highlander Robotics, Somerville High School's FIRST Robotics Competition (FRC) Team, competed with their robot, *Obi Munch Kenobi*, in the 2020 FRC. The robot was designed, built, programmed, tested, and operated by Enroot students. A second-year Enroot Leadership Cohort student served as the robot operator, while another student from the Emerge Cohort acted as the human player. The team advanced to the semi-finals, ultimately earning the Engineering Inspiration Award, which recognized the team's outreach to middle schoolers, participation in community events, and presentation to FRC judges.

Empowering Young Mathematicians: *Middle Schoolers Transform Math Learning with Creative Game Design* Three innovative middle schoolers—Angeliz, Ilwaad, and Lelia embarked on a journey of math and creativity during their Personalized Learning Block at Cambridge Street Upper School. The trio was involved with YPP's Math Playbook. In collaboration with Cambridge Public Schools, this program empowers middle school students to actively shape their math education through creative and playful design. Inspired by the 2023 Pi Day celebrations at the MIT Museum, these young mathematicians developed "Piece of Pi(e)", a dynamic memory matching game using pizza slices to teach equivalent fractions. Its versatility allows for adjusting for students at different points in their math development, and it can be played as a pair matching game or in a competitive group setting.

Recognizing the potential of "Piece of Pi(e)" to transform math education, the Cambridge STEAM Initiative team has strengthened its partnership with YPP by collaborating with the students throughout 2024. Together, they refined and play-tested new iterations of the game, ensuring it not only met educational standards but also resonated with the broader community.

"Piece of Pi(e)" exemplifies the spirit of innovation and studentled learning fostered by YPP's Math Playbook program. It underscores how creative collaboration can make complex math concepts more relatable and fun.

IMPACT REPORT 2018 - 2024





Photo: Young People's Project Youth Playbook activity

guests attended the 2nd annual Pi Day celebration, co-hosted with the MIT Museum >90% of YPP participants are students of color **The Young People's Project (YPP)** is dedicated to fostering math literacy, particularly among students from marginalized backgrounds. YPP aims to empower these students with the skills essential for academic and life success in efforts to dismantle institutional barriers. By actively engaging students in programs, both during and after school, YPP enhances individual achievement and promotes broader societal equity.

Math Literacy Workers (MLWs) are students who teach math-based activities to younger children, enhancing their own understanding of math concepts while developing social and professional skills. In the 2023-2024 school year, 58 high school and 14 college MLWs served over 400 K-12 participants in Cambridge and Somerville. This success led to the creation of an elective course at Cambridge Rindge and Latin High School, training MLWs to teach Flagway to middle schoolers both after school and during regular school hours.

Math Playbook is a collaborative project between CPS students and educators aimed at enhancing math education. Through co-design, they created a playbook that includes imaginative, participatory teaching methods. In 2023-2024, students developed games and hosted math pop-ups across Cambridge. **See page 14 for an example**.

HIGHLIGHTS

YPP 7th grade low-income Flagway students showed a higher growth in math achievement MCAS*, with an average Student Growth Percentile (SPGs**) of 70.8%, compared to 57.5% for their peers not in YPP. On May 18, 2024, YPP hosted the **8th annual Flagway Tournament** in Cambridge with teams from across five states playing with a total of 96 students, 56 MLWs, 11 college MLWs, and dozens of families. **See CPS page for more details**.

Average Student Growth Percentile



"We recognize that test scores do not reflect the full impact of our programming. YPP is building individuals and communities so that our participants can actively engage in changing the systemic impacts of multi-generational gaps in our public education system."

*Massachusetts Comprehensive Assessment System **SPGs measure change in a student's achievement from previous years to the current year, compared to peers with similar past performance. SGPs range from 1 to 99. Only students with consecutive yearly scores receive an SGP.

- YPP





Photo: Lesley STEAM Learning Lab

HOME



The Lesley STEAM Learning Lab is a hub for pioneering new learning opportunities through engagement and inquirybased exploration. Embracing the "maker" philosophy, it provides a dynamic space for students and community partners to play, tinker, design, and create. Committed to culturally responsive and equity-oriented pedagogies, it aims to inspire students by showcasing diverse experiences in STEAM. They use multiple entry points to ensure increased access for underrepresented youth in STEM. Collaboration with educators, both in schools and out-of-school settings, enhances their capacity to engage underrepresented populations through authentic and culturally respectful activities.

Professional Development: The Lesley STEAM Learning Lab collaborated with both districts to promote equitable science and math instruction. They provided various professional development opportunities including the cross-district summer institutes for high school math and science educators on **Complex Instruction (as detailed on page 8)**. Additionally, Lesley faculty assisted Somerville with curriculum reviews and standardization of supports/enrichments, participated in "Inclusion and Internships" committee work in Cambridge, and presented "**Art, AI & Robotics: Designing More Inclusive Pathways to CS and STEAM**" to 40 educators at the MassCUE annual conference.

STEAM Curriculum: Instructables were created for teachers to use to support and deepen STEAM understanding within a culturally relevant context. These lessons have received over 33,000 views.

HIGHLIGHTS

Authentic, Real-world Experiences:

- Engaged over 400 Cambridge middle school students at the "6th Grade Computer Science Playground," in hands-on coding, art, and Al activities
- Organized 7th grade students from Somerville for a visit to the Harvard Museum of Natural History
- Offered STEAM-focused activities in Cambridge Youth Programs

• Developed an interactive block-based neighborhood to study heat reflection and absorption as part of the Climate Change Curriculum launched at the Climate Palooza event 16

 Collaborated with the City of Somerville and SPS to offer climate action activities for struggling middle school students during spring vacation week HOME

SOMERVILLE PUBLIC SCHOOLS (SPS) HIGHLIGHTS OF COLLABORATIVE STAR ACHIEVEMENTS

Increasing Math Literacy: SPS partnered with YPP to establish a Flagway team led by a 6th grade teacher, later incorporating Flagway into their "STEAMland" after-school program. SPS plans to collaborate with the City of Somerville's Workforce Development team based out of the Mayor's Office to classify high school Math Literacy Workers (MLWs) as part of workforce development particularly in STEM fields. Near peer learning is a top priority of the district.

Career and College Readiness: Somerville HS's (SHS) engagement with BTGB's program through STAR has significantly impacted College & Career Readiness (CCR) initiatives. In the past year, approximately 40 SHS seniors participated in BTGB's program and benefited from college tours, financial aid workshops, and Saturday programming. Throughout the year, staff of CCR and BTGB collaborated, meeting regularly to coordinate support and enhance opportunities for college and career preparation for these students.



Design Lab: Cross-District Collaboration Increases

Youth Voice: One outcome of the regular ongoing meetings of all STAR partners was an invitation from CPS for SPS staff to join a professional development series using their Design Lab (DLab) model. This model fosters reflection on design approaches and supports educational projects.

STAR members from SPS and CPS worked to adapt the model for SPS, initially partnering with Harvard Graduate School of Education to run an after-school DLab club at SHS. Students researched youth spaces, leading to the creation of three youth centers in collaboration with the City of Somerville and a local developer. Starting in the 2024-2025 school year, SHS administration will be working closely with groups like DLab to expand ways in which students can have more of a voice during decision making.

New STEM Courses: Lesley STEAM Learning Lab has led key STEM education initiatives within SPS, including co-developing the Art, Al & Robotics Pre-College course which will be part of SHS's curriculum in Fall of 2024 and the AP Computer Science Principles course. Both courses provide students, typically underrepresented in STEM, diverse pathways to explore advanced curriculum.



of STAR SPS students are from social identity backgrounds underrepresented in STEM over all years*

TOTAL NUMBER OF STUDENTS IN SPS: 4,927

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* Students that identify with one or more of the following: Women/Girls, Black/ African American, American Indian/Alaskan Native, Pacific Islander, Hispanic, Latinx, Multilingual Learners.

CAMBRIDGE PUBLIC SCHOOLS (CPS) HIGHLIGHTS OF COLLABORATIVE STAR ACHIEVEMENTS

Empowering School Districts with Data Capacity:

The extensive impact and benefits of the STAR Data Specialist positions were highlighted in a **white paper** co-authored by Cambridge Public Schools and Root Cause in December 2022. The work of data specialists has allowed OST (Out of School Time) programs to support recruitment of high priority students who otherwise would not have access to STEM-based and other enrichment programming, enabling these programs to better meet students' needs.

Collaborative Math Initiatives: In the 2023-2024 school year, YPP supported three middle school Flagway teams and co-hosted the **National Flagway Tournament** with CPS. This tournament, designed for 5th-8th graders, promotes mathematical learning through active engagement and teamwork, combining athleticism with the mastery of mathematical concepts.

Additionally, CPS and YPP partnered on a Math Playbook program at Cambridge Street Upper School, where students created math games for elementary and middle school students. The **Cambridge STEAM Initiative** will provide funding to mass produce one of the student-designed games for distribution to classrooms, OST programs, and families. Fostering STEM Interest: Enroot's presence and work at Cambridge Rindge and Latin School (CRLS) have significantly contributed to expanding and supporting underrepresented students in building interest in STEM majors and careers. A popular "Lunch and Learn" series provides students with hands-on STEM learning opportunities. Additionally, during their spring career fair month, Enroot hosted a panel featuring 13 professional presenters at CRLS. These efforts align with Cambridge's goal of offering students guidance and pathways to success beyond high school.

Supporting STEM Professional Development and Urban

Gardening: In addition to Lesley's extensive work in the district noted previously, they also collaborated with various school and community members to start the Sustainable Urban Gardening for Teaching and Learning initiative and offered a Sustainable Farming Course in collaboration with CRLS, that provided master's+ credit to educators.





of STAR CPS students are from social identity backgrounds underrepresented in STEM over all years* 18

TOTAL NUMBER OF STUDENTS IN CPS: 6,915



* Students that identify with one or more of the following: Women/Girls, Black/ African American, American Indian/Alaskan Native, Pacific Islander, Hispanic, Latinx, Multilingual Learners.

CELEBRATING SIX YEARS OF IMPACT: ADVANCING STEM EDUCATION AND EQUITY THROUGH STAR

"Systems change needs time and consistent effort to take root and grow. The STAR Initiative has provided the resources and extra support necessary to nurture this evolutionary process."

— SUE CUSACK, Director, Lesley STEAM Learning Lab



Over the past six years, the Biogen Foundation's steadfast investment of over \$12 million has empowered grantees and school districts to collaborate effectively, share resources, reach more students, and innovate. This commitment has fostered a responsive and adaptable network, meeting the evolving needs of students, educators, and families.

The results are encouraging. STAR participants are demonstrating a higher likelihood of enrolling in advanced STEM courses and achieving passing grades in 9th grade STEM classes compared to their peers. This progress highlights the initiative's success in enhancing student achievement and supporting underrepresented youth through an equity-centered approach.

As we reflect on these six years of impact, the positive outcomes affirm the value of STAR's mission and its role in shaping a more inclusive and dynamic STEM future.

EXPLORE MORE RESOURCES

- STAR Impact Reports
- STAR Initiative's Public Dashboard
- Lesley STEAM Learning Lab
- The Biogen Foundation STAR Initiative & CPS Impact white paper

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prootCAUSE

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