

1. Overview

Sprout and S.T.E.M. (SAS) is a 501(c)(3) nonprofit organization that provides historically-marginalized students with academic and financial resources, such as tutoring, mentorship, professional development opportunities, and scholarships. The organization collaborates with community partners to ameliorate systemic dysfunctions in public education throughout Rhode Island.

In partnership with The Met School—an urban public high school in Providence—the organization supports students who experienced setbacks due to online learning during the COVID-19 pandemic and are at risk for remediation. To improve academic performance and outcomes, the organization delivers educational interventions, stimulates an interest in science and math, and inspires the pursuit of post-secondary education.

SAS is led by an administrative core of young professionals, including medical students from The Warren Alpert Medical School, and is comprised of a diverse team of interns, tutors, and research assistants. Presently, the organization is seeking additional undergraduate and graduate students to support its academic programs and research initiatives.

2. Team

Our team demonstrates a broad range backgrounds, experiences, perspectives, and career ambitions, yet shares the common goal to nurture and enrich the academic experience of disadvantaged students.

Diverse in our experiences.



Collective in our character.



3. Pillar 1: Academic Support and Interactive Learning

Our journey began in early 2020 at Classical High School where SAS offered academic support in biology, chemistry, physics, and math. Shortly thereafter in response to the COVID-19 pandemic, the organization pivoted to become a free online tutoring service.

In 2021, SAS partnered with The Met School (The Met) as an enrichment opportunity in the school's *Extended Day Program* where SAS has since hosted biweekly tutoring sessions in math. There, students have developed their quantitative reasoning skills by engaging in lessons focused on algebra and geometry topics.

These lessons are designed to be highly interactive and compelling, as seen below where students were tasked with painting planters, charting the growth of wheatgrass, and extrapolating future growth with linear functions.



4. Pillar 2: Inspiring the Pursuit of Careers in S.T.E.M.

In addition to providing academic resources, our team serves as mentors and role models who inspire the pursuit of higher education and professional development. SAS acknowledges and emphasizes the moral imperative of ameliorating the structural barriers experienced by disadvantaged students, and aims to increase retention of historically underrepresented demographics within the S.T.E.M. pipeline.

5. Pillar 3: A Tradition of Giving



In 2021, dozens of key donations helped springboard the *Sprout and S.T.E.M. Academic Scholarship*, which has since awarded six merit-based scholarships totaling in \$3,000.

All recipients are graduating seniors from urban public high schools who have declared intent to pursue college-level study in a S.T.E.M. subject area and demonstrated a commitment to academic excellence and community involvement.

7. Pillar 4: Research Initiatives

In an effort to document our impact on academic performance and socio-emotional well-being, SAS has developed a research division that is focused on measuring students' progress throughout our tutoring program. These initiatives have been supported by research assistants who have created assessments to evaluate comprehension in math and a survey adapted from a validated research tool to gauge socio-emotional development.

In accordance with the learning standards set forth by the Rhode Island Dept. of Education, research assistants created the *Geometry Learning Assessment* and *Algebra Learning Assessment* to determine whether students exhibited an increased proficiency in math by the completion of the tutoring program.

Outcome	Value $\pm \sigma$
Mean baseline raw score*	16.7 \pm 6.1 (n=13)
Mean final raw score*	27.8 \pm 10.4 (n=12)
Percentage change in mean raw score	+ 66% (n=10)
Average change in raw score*	+ 11.1 \pm 9.5 (n=10, $P < .05$)

*Indicates score out of a total 38 possible points on the Geometry Learning Assessment

Figure a. Results of correlated T-test at increasing levels of significance ($P < .05$) for standardized mathematics assessment administered to students enrolled in the program for the Spring 2022.

Research assistants also recontextualized the questions in the Piers-Harris Self-Concept Scale—a self-reporting questionnaire that assesses self-concept in children—to generate the *Student Survey* and identify changes in students' attitudes toward math.

α	p-value	1	2	3	4	5	6	7	8	Full Survey
0.2	0.879	2.65	0.90	1.88	3.11	1.00	1.99	1.79	1.46	2.70
0.1	1.372	2.65	0.90	1.88	3.11	1.00	1.99	1.79	1.46	2.70
0.05	1.812	2.65	0.90	1.88	3.11	1.00	1.99	1.79	1.46	2.70

Figure b. Aggregate results of a correlated T-test at increasing levels of significance ($P < .20$, $< .10$, and $< .05$) across eight socio-emotional sub-domains (confidence, group efficacy, self-confidence, arousal, mastery experience, learning, comfort, and ambition, respectively).

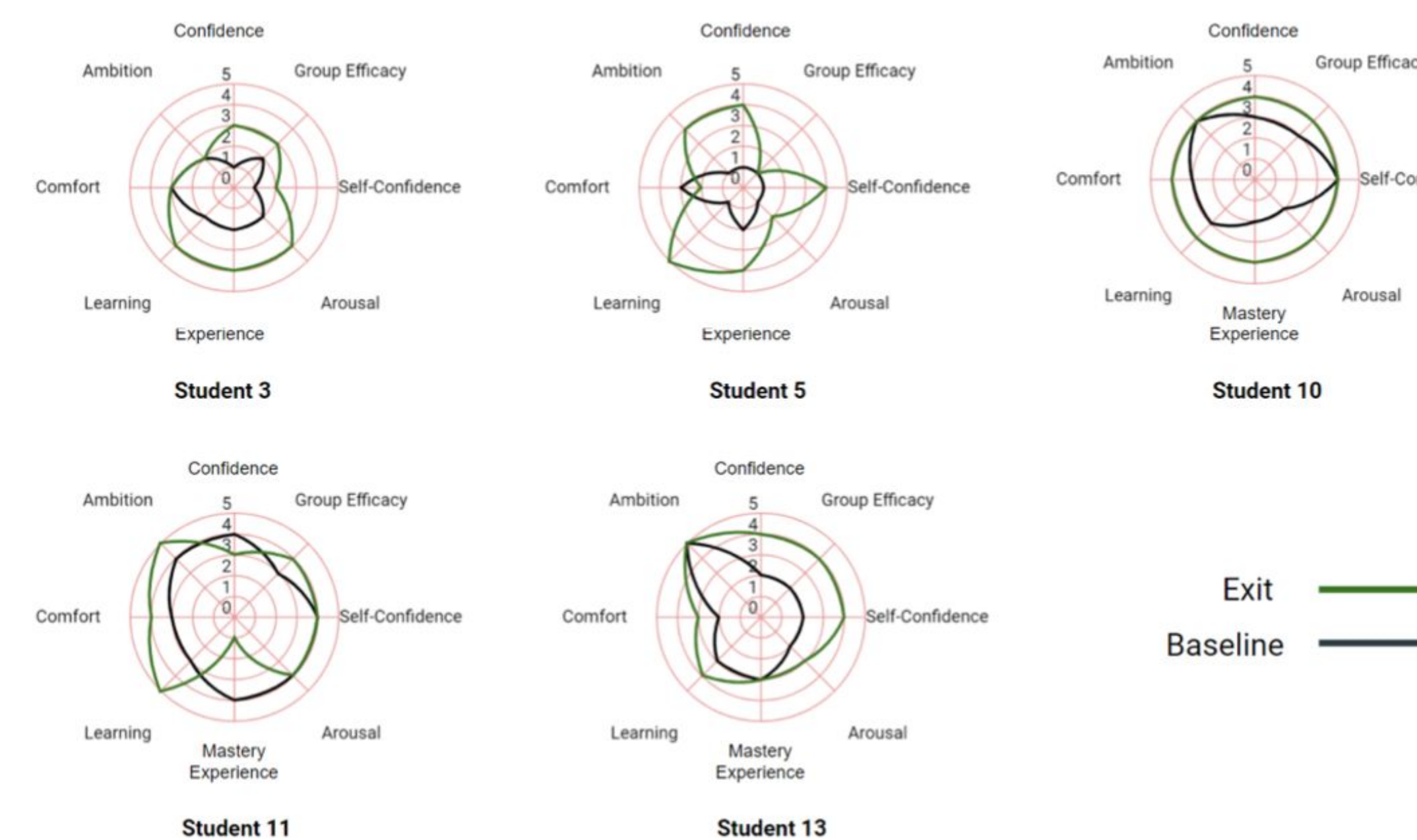


Figure c. Radar graph representation of students' entry (baseline) and exit survey performance according to each of the eight domain items.

The data generated by these assessments is suggestive of positive growth in both academic performance and socio-emotional well-being, in the context of math, among students in the SAS tutoring program at The Met. SAS will continue these research initiatives to further support an evidence-based argument for the inclusion of similar programs in school systems seeking solutions to improve student outcomes.

8. A Guided Path for Personal Growth and Professional Development

Sprout and S.T.E.M. has tailored a roadmap to support tutors, interns, and research assistants who are interested in joining the organization for the duration of their undergraduate study. That said, students can join apply to join the organization at any point in time.

Roadmap for Tutors

Year One – Tutor I

- Onboarding, tutoring certification
- In-person tutoring at The Met School
- Core competencies:** *Service Orientation, Social Skills, Verbal Comm.*

Year Three – Research Assistant

- More significant leadership role supporting Tutoring Coordinator and administrators
- Conduct research project, analyze data, and draft manuscript
- Core competencies:** *Critical Thinking, Quantitative Reasoning, Written Comm.*

Year One

Year Two

Year Three

Year Four

Year Two – Tutor II

- In-person tutoring at The Met School
- Review education literature and design research project for Year Three
- Core competencies:** *Cultural Competence, Capacity for Improvement, Scientific Inquiry*

Year Four – Administrator, Board Member

- Experiential learning via internship (ITR Internship Program); serve as Tutoring Coordinator or an administrator
- Join the nonprofit's Board of Directors
- Core competencies:** *Human Behavior, Reliability and Dependability, Teamwork*

Sprout and STEM

9. Why Join?

Consider the opportunity to work alongside like-minded individuals who are passionate about service, education, teaching, mentoring, research, and science and math. Our members strive to:

- Serve the local community
- Explore career opportunities
- Enhance their core competencies
- Contribute to ongoing research projects
- Broaden their professional network
- Enhance their prospects for postgraduate education
- Carve their path as leaders in their respective disciplines

SAS provides unique experiences and helps cultivate valuable talking points for interviews with employers or admissions committees. A large proportion of our team is represented by **pre-medical** and **pre-dental** students who are taking a creative approach to enhance their prospects for postgraduate education. In recent years, this strategy has proven effective as dozens of former staff members have been accepted to medical, dental, and graduate schools.

Sprout and S.T.E.M. is a bridge to medical school and other professional careers.

Brenton Travers
Evan Galuska
Fatine Oliveira
Victor M. Hunt
Weston de Lomba
Kate Williams
Wilfredo Tangui
Sabrina Fagan
Christine Ortiz
Padmini Karamchedu
Lila Berle
Emily Cronin
Callan Bleick
Emma Shychuck

Brown University, Warren Alpert Medical School
Brown University, Warren Alpert Medical School
Brown University, Warren Alpert Medical School
Brown University, Warren Alpert Medical School
Brown University, Warren Alpert Medical School
Drexel University College of Medicine
Johns Hopkins University, Bloomberg School of Public Health
Liberty University, College of Osteopathic Medicine
State University of New York, Upstate Medical University
University of Connecticut School of Medicine
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