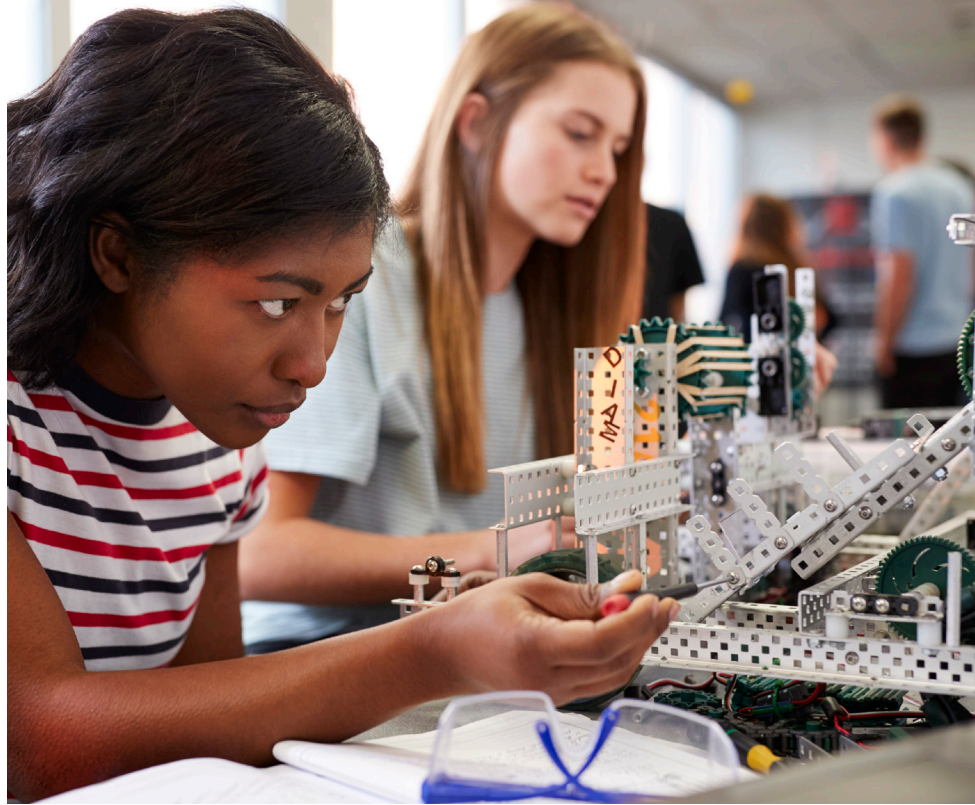


# Building Georgia's STEM Workforce

Increasing children's access to science, technology, engineering and mathematics (STEM) is essential for building a prosperous economy in Georgia. Studies estimate that nearly 80% of future careers will require awareness and application of STEM<sup>1</sup>. Afterschool can help fill this need.



GEORGIA STATEWIDE AFTERSCHOOL NETWORK



## Introduction

Without stimulating STEM education that engages students along the K-12 continuum, youth will not be equipped to take advantage of future career and economic opportunities. With students spending more than 80 percent of their time outside of formal classroom learning<sup>2</sup>, afterschool and summer learning programs are critical partners in closing the skills gap by offering both additional time and opportunities for students to experience hands-on STEM learning. Afterschool programs can help ensure that Georgia's youth are prepared with the skills necessary to thrive in college, career, and life.

## Are Georgia's Children Prepared for Future STEM Careers?

In the next ten years, STEM careers in Georgia are expected to grow 13% compared to non-STEM jobs at 8% with most growth in advanced manufacturing, computing, and engineering.<sup>3</sup> However, progress in math and science achievement has slowed in Georgia in recent years with only 35% of 4th grade students and 31% of 8th grade students performing at or above the National Assessment of Education Proficiency (NAEP) in math and science between 2015-2017.<sup>4</sup> Moreover, racial achievement gaps persist and not enough students get the chance to learn rich and challenging content that helps them develop an interest in STEM fields and prepares them to thrive in STEM careers.

According to Georgia math assessments in 2017, 44% of White 4th grade students and 50% of White 8th grade students were proficient in math compared to only 14% of Black

STEM careers  
in Georgia are  
expected to grow  
**13%**

4th grade students, 18% Black 8th grade students, 23% of Hispanic 4th grade students and 25% of Hispanic 8th grade students.<sup>5</sup> Low completion rates from a post-secondary institution further narrows the pipeline of students who can gain STEM skills. In 2015, 23% of certificates and degrees received in Georgia were in STEM fields but there were large disparities between students of color and women compared to men. Students of color only received 37% of computing degrees and certificates and 11% of engineering degrees and certificates. Women only received 1745 computing degrees and certificates compared to 4397 received by men and 922 engineering degrees and certificates compared to 3163 received by men.

## Impact of Afterschool Programs

Afterschool and summer learning works to ensure that all students no matter what zip code they grow up in have access to hands-on opportunities that will help them learn and grow. A study of afterschool programs serving 3,000 students, found that regular participation in high quality afterschool programs results in significant gains in math achievement and positive results in reading achievement particularly in elementary grade levels and in high school.<sup>6</sup> Afterschool programs also offer a broad array of enriching activities that help students improve critical foundational skills, build their communication skills, learn how to work collaboratively, and foster confidence in themselves.



The 50 State Afterschool Network

### Afterschool Supports STEM Learning

High quality STEM afterschool programs show great promise for engaging and building confidence in young people. A study conducted by the Afterschool Alliance found that youth who regularly participated in a STEM afterschool program showed increased motivation to enroll in science courses, confidence in tackling science projects and improved attitudes towards STEM careers.<sup>7</sup> A survey of 1600 youth across 160 afterschool STEM programs revealed that 73% of students have a more positive STEM identity and self-confidence, one of the strongest predictors of whether or not a young person will pursue a STEM field or career.<sup>8</sup>

**73%**  
of students have a more  
positive STEM identity and  
self-confidence

A nationwide  
afterschool program reported  
**70%**  
of its students pursued  
post-secondary education  
and careers in  
STEM fields.

The Afterschool Alliance gathered evaluation data from a strong selection of afterschool STEM programs to measure their impact on youth. Participation in an afterschool STEM program was found to increase STEM knowledge and skills, including gains in computer science and technology skills, and result in a higher likelihood of graduation and pursuing a STEM career. One afterschool program serving 25,000 children and youth found that 80% of students reported that the program was the most important source of support for pursuing a career and 97% said that it taught them to set high goals and expectations of themselves.<sup>9</sup> Another nationwide afterschool program reported that 70% of its students pursued post-secondary education and careers in STEM fields.<sup>10</sup>

### Afterschool Supports Workforce Development

High quality afterschool STEM programs play an integral role in developing the knowledge and skills necessary to equip the future STEM workforce. Innovative afterschool programs, especially those serving students from low-income communities, provide youth computer coding, robotics, or career-themed clubs to which they may otherwise have not been exposed and support youth in developing the foundational skills employers seek such as critical thinking, problem solving, teamwork, and communication. They ready youth by opening their eyes to different opportunities and career pathways, from teaching them about the spectrum of jobs in the STEM fields to connecting them to internships and apprenticeships.



## PARTNER SPOTLIGHT: STARBASE ROBINS

STARBASE ROBINS is a Department of Defense (DoD) educational program that offers a hands-on STEM curriculum to students from local school systems as well as several area private schools.

DoD STARBASE focuses on elementary students, primarily fifth graders. The goal is to motivate them to explore STEM topics as they continue their education. The program engages students through the inquiry-based curriculum with its “hands-on, mind-on” experiential activities. Students explore nanotechnology, navigation and mapping. They design space stations, all-terrain vehicles, and submersibles. Math is embedded throughout the curriculum and students use metric measurement, estimation, calculation geometry and data analysis to solve questions. Military volunteers apply abstract principles to real world situations by leading tours and giving lectures on the use of STEM in different settings and careers.

STARBASE 2.0 After School STEM Mentor Program combines STEM activities with a relationship-rich, school-based environment to provide the missing link for at-risk youth making the transition from elementary to middle school. It extends the positive impact of STARBASE through a team mentoring approach which solidifies students’ attachment to school and engagement in STEM.

Analysis of STARBASE data found a positive impact on the CRCT science and math scores for STARBASE students compared to similar non-participants. On average, STARBASE students scored higher than non-participants.

These tables show how many points higher students in STARBASE scored on the CRCT math and science in 2014 compared to non-participants.<sup>12</sup>

### BIBB COUNTY

	Math	Science
All Students	19.6	26.1
Black Students	15.4	22.8
Female Students	49.4	56.7

### HOUSTON COUNTY

	Science
Hispanic Students	13.4
Economically Disadvantaged White Males	6

## Standards for Afterschool and Summer Learning

ASYD Quality Standards, have several standards related to STEM and skills most sought after by employers.

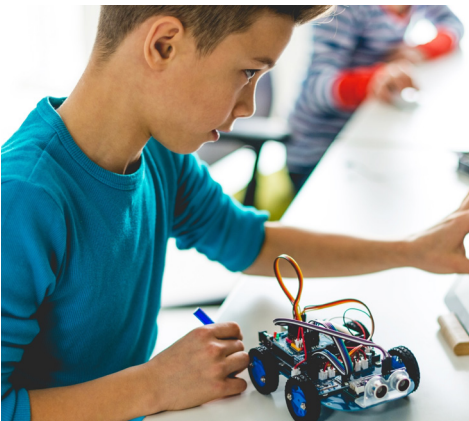
High quality STEM afterschool and summer learning programs that provide environments and experiences that benefit youth socially, emotionally, and academically are associated with gains in student outcomes. Endorsed by five state agencies, Georgia’s own standards for afterschool programs, known as the Georgia Afterschool & Youth Development (ASYD) Quality Standards, have several standards related to STEM and skills most sought after by employers including:

- **STANDARD 1.2** Offers project-based and/or experiential and hands-on activities on a daily basis.
- **STANDARD 1.8** Includes opportunities for reflection and promotes critical thinking and problem solving skills.
- **STANDARD 1.11** Incorporates opportunities for youth to gain competency in STEAM (science, technology, engineering, arts and mathematics).
- **STANDARD 1.13** Provides opportunities for college and career readiness, vocational preparation, and workforce development.<sup>11</sup>

# Recommendations

Afterschool and summer learning programs are a key part of the solution in addressing Georgia's STEM skills gap but there is an unmet demand. Almost 600,000 more youth in Georgia would participate in an afterschool program if it were available to them.<sup>13</sup> Beyond directly delivering rich, STEM learning experiences, afterschool can support a number of measures shown to impact young people's attitudes towards STEM, such as social emotional learning. Georgia can support afterschool and summer learning programs and STEM learning by:

- Increasing investment in innovative afterschool and summer learning programs that introduce students to new interests and a diverse range of STEM careers.
- Including afterschool and summer learning as strategies to support CTAE learning in Georgia's state plan.
- Strengthening partnerships between school districts, community based organizations, and businesses at the local, regional and state levels to connect STEM learning beyond the school day and provide relevant, real world STEM experiences for students.
- Providing joint professional development opportunities for classroom teachers, Career Technical Education (CTE) instructors and afterschool and summer educators. Bringing afterschool educators and school day CTE educators together can streamline coordination and build a robust and diverse workforce of CTE educators throughout a student's in and out-of-school experiences.



For more information on afterschool in Georgia, go to [www.afterschoolga.org](http://www.afterschoolga.org).  
For references, go to [www.afterschoolga.org/afterschool-issues](http://www.afterschoolga.org/afterschool-issues).