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After-School STEM Programming Pilot: Assemble & Allegheny County Partnership

Executive Summary

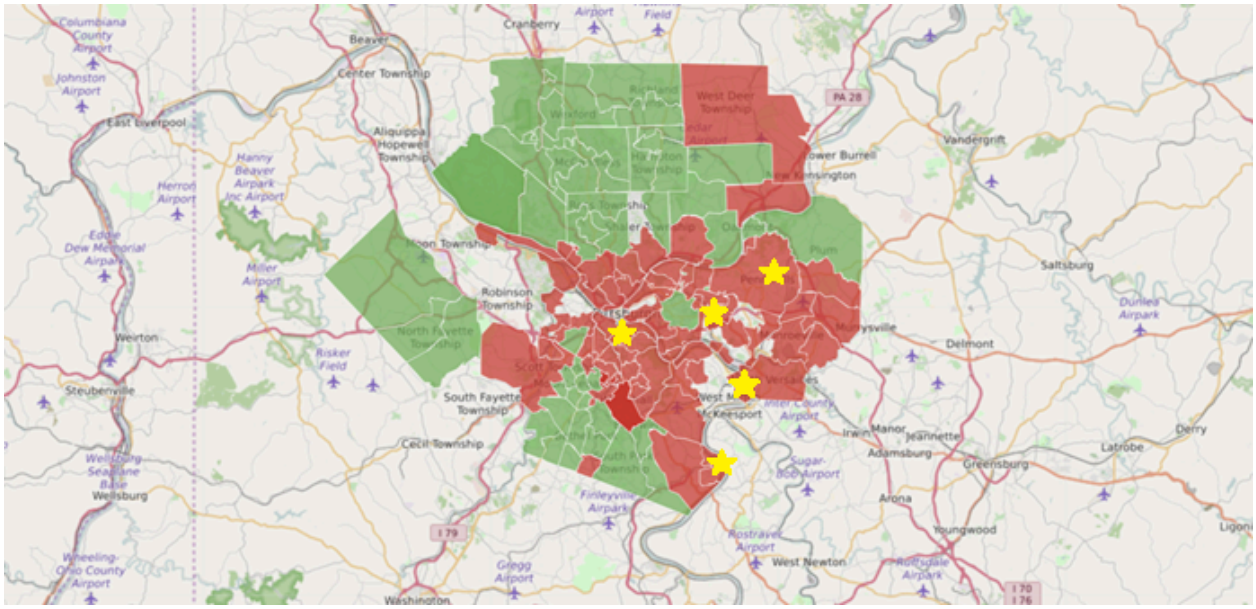
My proposal outlines an extended partnership between the Assemble organization and the Allegheny Department of Children's Initiatives (DCI) to launch an afterschool STEM pilot in three underserved elementary schools in Allegheny County. Schools in the greater Pittsburgh area remain sharply divided in performance across socio-economic lines. Thus, students in poorer districts continue to fall behind. In order to close the gap, I propose a 1.5 year pilot to serve roughly 1,200 students in the region's most underserved communities.

The pilot leverages Assemble's NGSS and PA STEELS compliant "On the Go" curriculum that has already been successfully implemented as part of the DCI's 2025 Northgate district summer program. This project will deliver high-quality, project based after-school STEM learning to many schools, which currently do not have the capacity to offer on their own. With an estimated $500,000 increase in funding to Assemble's operating budget that they will obtain through a variety of streams, Assemble will spark life-changing interest in STEM careers through hands-on programming, and help address enduring educational inequities across the Pittsburgh region.

Prevalent Socioeconomic Inequalities in Allegheny County Public Education

Allegheny County is home to a diverse range of 43 school districts, and fragmentation has led to drastic inequalities across these districts. While some districts rank amongst the top 5% of all in Pennsylvania, others fall to the bottom 5%. This disparity is driven by a lack of resources and meaningful opportunities in underserved districts, considering that many of these districts were originally drawn on socio-economic lines. Particularly, inadequate STEM education has stifled curiosity and confidence in critical fields including science, technology, engineering, and mathematics.

Burden of Underserved Districts Lacking Project Based STEM Education



Underprivileged students in Allegheny county are performing disproportionately worse than students in other districts. The figure above shows a map of all Allegheny County school districts, with Title I districts in red and non-Title I districts in green.[1] The bottom five worst performing districts in the county are starred in yellow, and it is clear that the districts that are furthest behind are located in the poorest parts of the county.

Inadequate STEM education in Allegheny County is something that is detrimental to allowing students to develop deep curiosity and confidence in STEM fields. Without adequate programming in place, long-term interest in science, technology, engineering, and mathematics continues to be stifled in a vast portion of the young student population. Many K-12 students, especially those who come from low-income backgrounds are deprived of access to meaningful opportunities and hands-on STEM

[1] Federally funded supplemental education program that provides financial assistance to local educational agencies to improve educational opportunities in districts where at least 40% of students come from families living below the poverty line

experiences. This lapse in education only reinforces the socioeconomic inequalities that already exist in the region.

This is exactly the sentiment of Kelly Rottmund, Partnerships Manager at APOST, as she stated that "STEM/STEAM learning is very important for students from underserved districts, because the data continually shows that students from higher income districts have access to more resources and opportunities both during and after the school day. Access to these experiences lead to disparities between districts in terms of test score, reading at grade level, and pursuing post-high school opportunities."[2]

Inspiration to pursue careers in STEM often begins at a young age. In fact, seventy-one percent of surveyed STEM students at Carnegie Mellon University reported that experiences related to project based STEM learning either "somewhat" or "strongly" influenced their choice of study later in life.[3] This further substantiates the need to expand project-based STEM learning in schools, considering that these undergraduate students reported that hands-on STEM experiences were part of what inspired them to pursue technical education years later.

Research shows that formal education institutions, such as the public school system, often fall short of sparking true engagement in STEM fields. Hall and Miro (2016) found that many classrooms with aspects of their curriculum labeled as "STEM programming" failed to engage students effectively, due to a deficiency in training or lack of resources for instructors conducting project-based learning activities. This means educators who aim to implement project-based STEM learning in the classrooms often lack the resources and expertise required to effectively inspire students, failing to use deep questioning or highlight ties across fields (Hall & Miro, 2016). Moreover, for many underserved schools, conducting project-based STEM activities is impossible, due to budget constraints and pre-existing understaffing.

[2] Email Correspondence with Kelly Rottmund, Partnerships Manager at Allegheny Partners For Out-Of-School Time (APOST), on 12/8/25
[3] CMU STEM Student Survey, 11/12/25

Informal learning institutions can play a pivotal role addressing these shortcomings. In their research, Codding et al. (2021) conveyed how community-based programs of collaboration between formal institutions such as universities and informal institutions such as public library programs could advance computer science education in the region. This model is clearly something that could be leveraged in Allegheny county to create initiatives that are met with greater community interest and excitement and are effective in fostering real change in the lives of young students.

Moreover, as Jane McCarty, the associate director of the Education Partnership, an Assemble partner organization, stated, educational support in underserved districts can have life-changing implications. Specifically, when asked about the feasibility of a pilot program such as the one I am proposing, Jane responded "Can project-based STEM education be expanded to afterschool programs? Yes, given the right support."[4]

Here in Allegheny county, the Assemble Organization exemplifies this potential. Having served this community for over 14 years as a center for STEAM engagement in underserved areas, Assemble is the perfect candidate to make expanding highly impactful project-based STEM learning into a reality. Through its workshops and mentorship opportunities, Assemble has already demonstrated the power of informal learning initiatives to foster immense growth and confidence in its young students.

However, Assemble's reach is still limited by its scale and access to resources. Enabling greater partnership between Assemble and the public school system to implement Assemble programming into afterschool programs in the classroom would have an undeniable impact on the education of underserved youth in Allegheny county.

Why Expanding Assemble Programming is the Best Solution to this Problem

[4] Phone Conversation with Jane McCarty, Associate Director at the Education Partnership, on 12/5/25

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To solve the problem of major STEM education gaps and inequities in Allegheny County, I propose a new structured partnership between the Assemble organization and underserved Allegheny county public elementary schools. I aim to begin cultivating this partnership through a year and a half long pilot program in three Allegheny county elementary schools with Title I designation. This pilot is a strategic partnership aimed at expanding the Assemble's pre-existing and proven STEM curriculum directly into afterschool programs where they are most needed.

The Assemble organization stands out as the most fitting candidate to bridge the gap between STEM branded programming and activities that will truly go on to inspire a generation of scientists, engineers, and professionals. With deep ties to the Pittsburgh community, Assemble has made considerable progress in its mission of cultivating inspiration and confidence about STEM fields in students of all ages over the past 14 years. Assemble serves 2400 students in Allegheny county through its various programs every year. Through my pilot program, Assemble would be expanding its reach by roughly 1200 students in some of the most underserved communities in Pittsburgh. This proposal is the start of an initiative to give students tremendous opportunities to be exposed to important career fields.

Importantly, Assemble already has a rich program for in school and after school activities, which can be leveraged right out of the gate for my pilot program. Assemble's "On the Go" curriculum is built off of the Next Generation Science Standards (NGSS) and PA STEELS Standards. The hands-on curriculum "promotes curiosity, problem-solving, discussion, and makes connections with STEAM careers and the everyday" (Assemble, 2025). Moreover, it has been developed from the ground up to meet nationally recognized standards and the PA Arts and Social Justice Standards. Project based STEM activities range from "Creative Chemistry" to "Coding with Scratch and Scratch Jr." Assemble has proven experience implementing these activities in summer camp programs for the Northgate School District of Allegheny County, which encompasses a suburban district across the boroughs of Bellevue and Avalon. This

programming was funded in large part through the DCI's School Community Summer Partnership, after Assemble applied to your organization's request for proposal.

Through my proposed pilot project, Assemble would expand this programming directly to three Title I designated elementary schools in Pittsburgh, ideally in some of the lower performing districts of the 43 school districts in Allegheny county. Considering that the Duquesne and Wilkinsburg school districts rank in the bottom five percent of all school districts in Pennsylvania, they would make good candidates for expanding project-based STEM education where it is likely not being provided.

How this Pilot Will Be Implemented

Assemble's current annual operating expenditure is roughly $1,000,000, and they serve approximately 2400 students. Assuming each of the new elementary schools in the pilot program is composed of 300 to 400 students, this would increase Assemble's reach by 900 to 1200 students. Assuming that the per student cost of programming stays the same, despite the fact it will likely be cheaper when integrated directly with school facilities, Assemble can expect a 50% increase in operating expenditure to go along with the 50% increase in students reached. This would mean Assemble would need upwards of $500,000 additional funding to implement my pilot program.

Considering that Assemble has already won a summer program contract for the Northgate school district in 2025, Assemble has proven they are capable of being highly impactful when working in alignment with formal learning institutions. Furthermore, as Sheila Bell, the director of grants at the regional oversight organization of public schools in the Pittsburgh area highlighted, there are many different government and non-profit grant opportunities for educational initiatives in Allegheny county.[5] For example, the Richard King Mellon and PASmart grants are specifically for STEM initiatives and they

[5] Phone Conversation with Sheila Bell, Program Director of Evaluation, Grants and Data at the Allegheny Intermediate Unit, on 12/1/25

total to $1,000,000. Through these revenue streams Assemble would be able to implement my pilot proposal.

Nevertheless, in alignment with the perspective of Kelly Rottmund, it may not currently be feasible to acquire funding from outside sources. Since "it used to be a lot easier to secure funding for after-school STEAM programming. However, in the last few years a few local foundations that supported out-of-school time have changed their funding priorities, and this has resulted in less funding being available. Additionally, there is just a greater demand for the funds that are available as individuals decrease the level of their individual giving to organizations (due to changes in personal finances)."[6] Thus, this proposal may require direct financial support from the DCI.

I estimate that the full proposal could be implemented in under 1.5 years: allocating 4-5 months for obtaining individual school and district level approval and to secure funding from the mentioned sources, 1-2 months for sourcing STEM kits and coordinating scheduling with pilot schools, and 9 months (1 school year) to implement the pilot. Evaluation can be done monthly during the final implementation phase.

Endorsing or Potentially Funding this Proposal Would Have a Transformational Impact on Underserved Allegheny Communities

I hope that the DCI will endorse this pilot proposal so I can move on to presenting the proposal to district administrators and the principals of the three initial pilot elementary schools. If funding cannot be obtained from outside sources, I hope that the DCI would consider funding this deeply impactful proposal as a potential afterschool initiative. The results of the pilot may motivate expansion of Assemble programming to dozens of schools in Allegheny County to remedy long-standing inequalities that have led to clear gaps in economic development across school district lines.

[6] Email Correspondence with Kelly Rottmund, Partnerships Manager at Allegheny Partners For Out-Of-School Time (APOST), on 12/8/25

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