

Chicago STEM Pathways Cooperative

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Cultivating Chicago's STEM Learning Ecosystem



Project Exploration

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*STEM Funders Meeting
April 2017*

Chicago STEM Pathways Cooperative

WE BELIEVE

Young people need meaningful experiences with science, technology, engineering and math (STEM) in order to become critical and collaborative thinkers.

Without an intentional plan for how young people will get – and stay – involved with STEM, the status quo will remain the same.

About

The Chicago STEM Pathways Cooperative (STEM Co-op) is a collaborative effort aimed at increasing access to high quality STEM programs, from early childhood to career. Its work is guided by the premise that access to high-quality, in-school and out-of-school STEM experiences can provide a strong foundation for success in adulthood and support civic, college, and work readiness. The STEM Co-op, led by Project Exploration, represents sectors throughout the city, including civic institutions, out-of-school time program providers, Chicago Public Schools, colleges and universities, STEM corporation and business industry leaders, funders, government entities, and existing learning networks. Members of the STEM Co-op work to improve the coordination of STEM learning, striving to ensure pathways for integrated and progressive STEM experiences extending from early childhood to adulthood. The STEM Co-op is a member of the national [STEM Funders Network STEM Learning Ecosystems Initiative](#).

Strategic Highlights

After the annual [Fall 2016 convening](#) of citywide members, the STEM Co-op's work has focused on three themes.

1. **Assessing STEM Learning Opportunities in Chicago:** In October 2016, the STEM Co-op re-launched the [STEM Landscape Survey](#). This survey looks at programming offered both in- and out-of-school in 2015, with the goal of providing an updated baseline for STEM learning opportunities across the city. As of right now, the STEM Co-op has paused collection of survey results given the slow response rate, and after considering the relevancy of 2015 data to today's STEM learning landscape. The survey will be relaunched at a future date.
2. **Developing a Demonstration Community:** A key strategic goal of the STEM Co-op is to work in partnership with community stakeholders, as proof-of-concept for how local assets can be leveraged and optimized to engage youth—cradle to career—from communities traditionally underrepresented in STEM. In 2016, after considering data from the 2011 STEM Landscape Survey and through community discussions, the Austin neighborhood was selected as the first

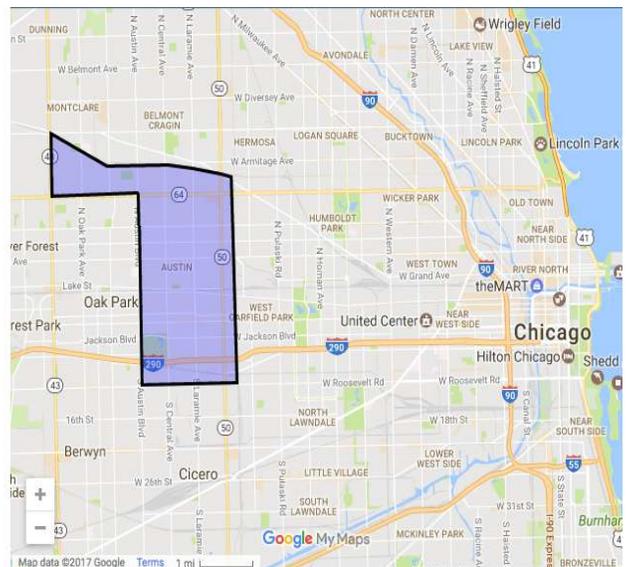
Demonstration Community. Over the past year, the STEM Co-op has cultivated partnerships with community-based organizations and hosted listening sessions within the Austin neighborhood. Through these efforts, the STEM Co-op has launched a number of initiatives that bridge the resources of the Co-op's membership to community-identified priorities and assets. Ultimately, the STEM Co-op aims to scale the participatory approach in Austin to additional Chicago neighborhoods.

3. ***Strengthening Core Infrastructure:*** While Project Exploration continues to serve as the backbone organization for the STEM Co-op, a multi-sector core team meets twice a month and is responsible for moving the STEM Co-op's agenda forward, coordinating collaborators and partnerships, identifying and pursuing funding opportunities, and leading meetings. Members of the core team were selected based on their ability to provide cross-sector visioning and layers of support, particularly around the Co-op's work in Austin.

Past Year in Focus: Building a Neighborhood-Level STEM Ecosystem

Austin, one of the city's largest neighborhoods (population 98,514¹), is the first Demonstration Community. The STEM Co-op is working with a diverse range of community stakeholders to map and build a connected STEM learning ecosystem that spans early childhood to career. Key partners include:

- [Austin Coming Together \(ACT\)](#), a community-based network of local entities committed to improving education and economic development outcomes in Austin.
- [Austin Early Childhood Collaborative](#), an initiative of ACT focused on increasing access to quality early learning programs for Austin's highest need children.
- [BUILD](#) (Broader Urban Involvement & Leadership Development), which provides



violence prevention/intervention, youth development, and college/career prep programs to at-risk youth.

- [Manufacturing Renaissance](#), which prepares high school youth for advanced manufacturing positions in Austin as a springboard for sustainable community development.
- [Austin Childcare Providers Network](#), which educates and trains childcare providers in underserved communities.

In January 2017, the STEM Co-op partnered with Dr. Pamela Sydelko, a systems-thinking expert formerly at Argonne National Laboratory, to conduct a systems-mapping workshop with 42 cross-sector stakeholders from local youth-serving organizations, Chicago Public Schools, corporate foundations, universities, and the Office of the Mayor. Participants created multi-component systems maps, identifying elements of Austin's STEM learning ecosystem and resulting in deep discussion about the importance of messaging, work-based opportunities, and mentorship for supporting Austin's youth in pursuing STEM pathways. Additionally, data and visualizations on Austin's engagement with [Chicago City of Learning](#) were presented by Dr. Sybil Madison-Boyd, a member of the STEM Co-op's Leadership Team.



Systems-thinking workshop with Austin community stakeholders, January 25, 2017

This workshop, coupled with feedback from neighborhood meetings over the course of the past year, have revealed the need to:

- a. Increase messaging and awareness of the value of STEM,
- b. Increase the number of young people engaged in existing STEM learning opportunities, and
- c. Provide community-directed ways for STEM Co-op member organizations outside of Austin to bring resources into the neighborhood.

As a result of this dialogue between local organizations and the STEM Co-op, groundwork has been laid for a number of STEM-learning initiatives to broaden participation for Austin's youth:

Early Childhood STEM Professional Development Pilot: The STEM Co-op and [University of Chicago STEM Education](#) have launched a two-year program to enhance STEM engagement for preschool aged children by providing professional development to teachers in home-based daycares in Austin's Childcare Providers Network. The project provides 1) general support for 12 early childhood teachers and directors from the broader Childcare Network, and 2) deep supports for a cohort of 6 teachers in Austin. The project draws upon strategies and recommendations identified by the Early Childhood STEM Learning Group in their January 2017 policy report, [Early STEM Matters](#). These strategies include early childhood educator training, engaging families, and optimizing the use of existing STEM learning resources in the daycares. The initial phase of the pilot is supported by CME Group Foundation.



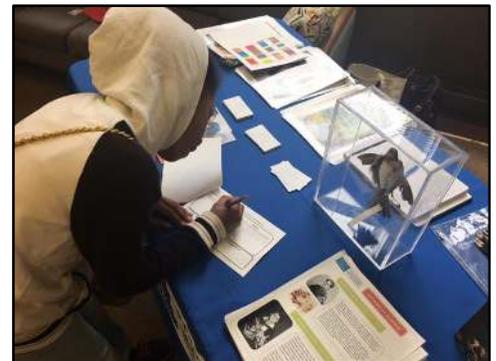
Planning meeting with the Austin Childcare Providers Network, June 27, 2017

Austin STEM Learning Center: The STEM Co-op will be leveraging space at George Leland Elementary High School to develop an Austin STEM Learning Center (SLC), which will serve as an anchoring site in the community for STEM learning pathways for youth. The SLC will focus on providing local middle school students with high-quality STEM opportunities that will positively impact their self-efficacy and confidence in science and engineering, and develop their critical thinking skills. The programs and opportunities developed for the SLC will be identified through a series of community meetings with stakeholder partners, including parents and youth, as well as concrete collaborations between local partners and STEM-focused institutions across the city of

Chicago. Ultimately, the SLC aims to be a neighborhood-based hub for youth, families, and teachers; it will amplify the value of STEM learning in the community and bridge citywide STEM resources with local assets. Community conversations, funded by the Chicago Hive Learning Network, will take place during the Fall of 2017, with the goal of launching a series of “residencies” for STEM Co-op organizations to implement programs within the SLC in 2018.

STEM Summit: On November 3, 2017, [Northwestern University Office of Community Education Partnerships](#) will bring the annual STEM Summit to Austin at Michele Clark High School. The STEM Summit brings together K-12 formal and informal educators, industry, and academia to advance and advocate for STEM inquiry in formal and informal education; improve and increase student capacity and interest in STEM education and career pathways; and bridge the gap between K-12, academia, and industry. Additionally, the summit will feature a workshop on problem-based learning approaches, specifically for 20 - 25 middle and high school Austin CPS teachers. This workshop is supported by the [Illinois Science and Technology Institute \(ISTI\)](#).

Community Outreach: Project Exploration has recruited STEM Co-op members to participate in a variety of neighborhood events, building visibility of STEM organizations and supporting awareness of STEM learning. In June 2017, the [Peggy Notebaert Nature Museum](#) participated in Austin Unites, a conference for 5th- 11th grade girls sponsored by Spencer Elementary Technology Academy and in partnership with Michele Clark Academy Prep Magnet School, Austin College and Career Academy, Frederick Douglass High School, DePriest Elementary School, and the 15th District Police Department. The Boeing Company and Project Exploration attended Austin’s first Annual Summer of Opportunity fest at Columbus Park.



Peggy Notebaert Nature Museum at Austin Unites



Several STEM Co-op members including [Argonne National Laboratory](#), [Chicago Architecture Foundation](#), Peggy Notebaert Nature Museum, and [Center for College Access and Success at Northeastern Illinois University](#) participated in the 37th Ward Alderman Emma Mitts' Back to School event at LaFollette Park. Additionally, Project Exploration participated in [BUILD's](#) Back to School Bash at the 15th Police District. Participating in these

neighborhood events has provided a way for the Co-op to engage community, bring STEM Co-op members to the neighborhood, and amplify the value of STEM learning. This has also led to more requests for STEM programming in Austin, both in schools and at community events.



STEM Co-op partners in Austin

A Year in Review: Deepening Work in Austin

In addition to the programs and initiatives described above, the STEM Co-op will engage more deeply with community stakeholders by strengthening partnerships, organizing local leadership around STEM learning, and bringing neighborhood residents to the problem-solving table. Additionally, as the STEM ecosystem expands in Austin, work-based opportunities will be incorporated to support career readiness and economic development. These strategies include:

- ***System Mapping with Austin Stakeholders:*** The STEM Co-op has submitted a proposal to the National Science Foundation for Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science ([NSF INCLUDES](#)) with the goal of engaging diverse stakeholders in Austin in creating system maps that highlight and uncover the interdependencies of the local STEM learning ecosystem. The proposed project will empower and

engage community stakeholders in a two-year series of systems-thinking workshops to develop common understanding, identify challenges, and act collectively on specific recommendations that expand STEM learning opportunities for Austin's African American youth.

- **Convene and Organize Local Leadership:** An Austin STEM Leadership Board has been established with a broad range of local leaders to ensure representation, inclusivity, and voice from the community. The Leadership Board will guide the vision of the STEM Co-op work in Austin, ensuring that the project has the support necessary for long-term success. The Board members, who will meet quarterly over the next two years, will advocate for STEM learning in the Austin community, liaise with residents, and review data on student participation and outcomes.
- **Community Engagement with Data:** Key to the STEM Co-op's work is to engage community members as participants and leaders in data discussions. To do so, the STEM Co-op is working with partners to identify, collect, and analyze data dynamically to support the neighborhood's effort in making data-driven decisions. One partner is [Illinois 60 by 2025](#), which supports a network of communities in Illinois that are committed to the goal of ensuring that 60% of all adults have a college or career credential by 2025. Illinois 60 by 25 will be able to provide dynamic dashboards about Austin's educational and economic landscape, providing critical data for continuous improvement along community-identified priorities and needs. Through discussions with the STEM Co-op, these dashboards will be customized to include STEM learning measures from CPS. In addition, the STEM Co-op has partnered with [Thrive Chicago](#) to support the intersection of school data with OST programmatic data, with the goal of providing a richer understanding of student participation and engagement with STEM learning opportunities.
- **Work-Based Learning Opportunities for Austin Youth:** The STEM Co-op will engage partners and businesses to build robust STEM learning pathways through work-based learning opportunities for Austin's youth. For example, over the next year, [Lumity](#) will bring its [Real World Projects](#) tech entrepreneurship and mentorship program to Austin with the goal of reaching 50 high school students. As STEM Co-op partners work more deeply with the Austin neighborhood over time, existing opportunities for Austin youth to pursue STEM careers and work opportunities will be made more accessible.

Looking Ahead: Year Three

Based on the work of the STEM Co-op over the past year, three themes emerge for the coming years. First, the STEM Co-op will strengthen core components of its infrastructure in areas such as scheduled convenings, regular communication, and the development of data dashboards to create baselines for neighborhoods in which the STEM Co-op is engaging community stakeholders. Ultimately, the STEM Co-op aims to achieve its mission of building high-quality STEM pathways by connecting partners and amplifying work through effective collaboration. To this effect, the STEM Co-op will restructure its past subcommittees and convene around existing initiatives, such as early childhood and computer science, in an effort to document and maximize learning opportunities for youth across Chicago. These new Affinity Groups will launch in Fall/Winter 2017.

Second, the STEM Co-op will focus on the neighborhood level for expanding STEM learning, with the work in Austin as a proof-of-concept model. By taking a neighborhood-based approach to developing STEM learning ecosystems, the STEM Co-op is piloting a community-organizing strategy that can be sustained locally and scaled to other neighborhoods. The approach also supports STEM Co-op members in bringing their resources, curricula, programs, and opportunities to neighborhoods in community-driven ways. The localized approach also supports the STEM Co-op in connecting with community-based initiatives in other neighborhoods to share best practices, reflect on data, and identify solutions to potential challenges.

Third, the STEM Co-op enhance its visibility—and the visibility of Co-op membership—by developing clear messaging about its work to support equity in STEM learning across Chicago. As a member of the National STEM Ecosystems initiative, the STEM Co-op will also disseminate lessons learned and best practices at both the city and national level.

Financial Summary

Project Exploration is pleased that the Albert Pick Jr. Fund, The Boeing Company, and Motorola Solutions Foundation have continued their support for the Chicago STEM Pathways Cooperative. In addition, the CME Group Foundation is supporting the early childhood efforts. Community discussions to inform programming at the Austin STEM Learning Center are supported by the Hive Fund for Connected Learning.



**MOTOROLA SOLUTIONS
FOUNDATION**



The Albert Pick Jr. Fund



Leadership Team

The Chicago STEM Pathways Cooperative Leadership Team is a cross-sector team of people that represent stakeholders involved in STEM Learning.

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Michelle Rabkin Senior Director of Education Peggy Notebaert Nature Museum	Amy Pratt Associate Director Office of Community Education Partnerships Northwestern University
Sybil Madison-Boyd Research Associate and Director Chicago City of Learning, Digital Youth Network, and Office of Community Education Partnerships, Northwestern University	Tony Streit Senior Project Director EDC
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Organization Information

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ⁱ <http://statisticalatlas.com/neighborhood/Illinois/Chicago/Austin/Population>