

THE CHANGING ROLE OF MUSEUMS IN ADVANCING SCIENCE EDUCATION

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Mission

The Museum of Science and Industry's mission is to inspire the inventive genius in everyone by presenting captivating and compelling experiences that are real and educational.

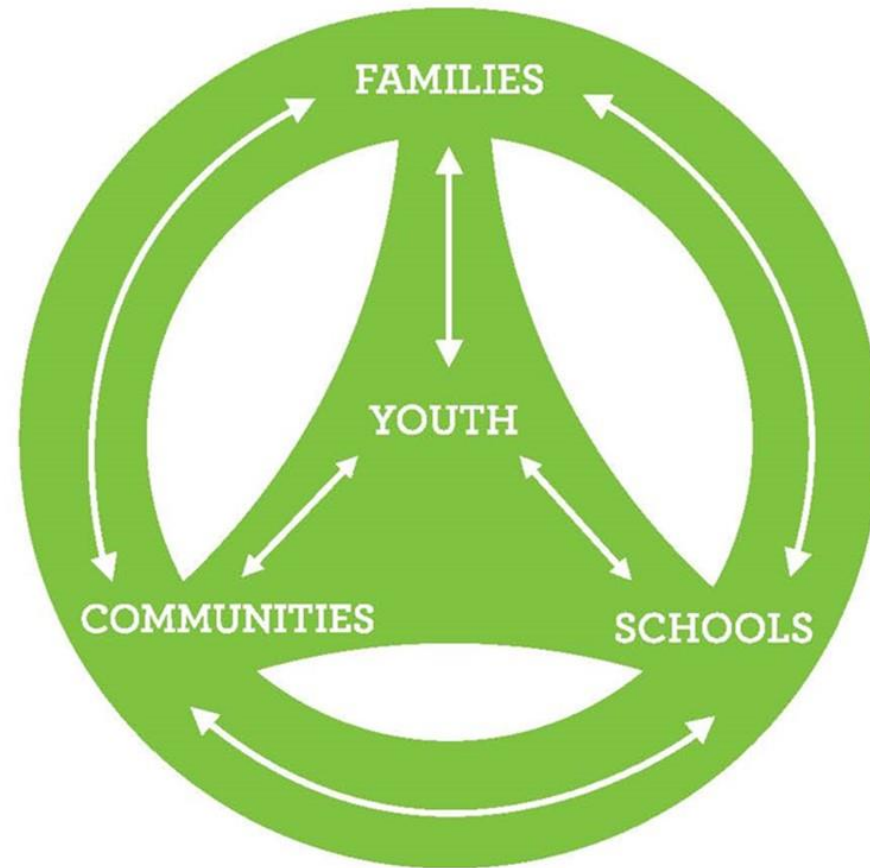


Each year, we reach approximately:

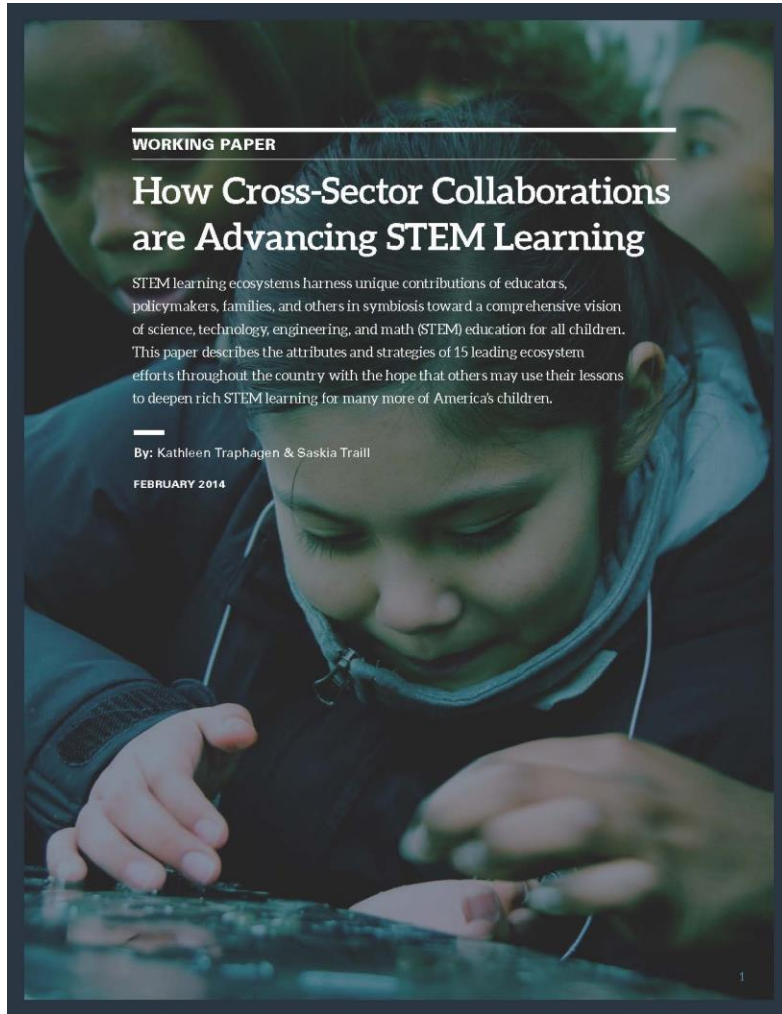
- 1.5 million visitors
- 320,000 students on field trips
- 300 teenagers through youth programs
- 12,000 children in after-school science clubs
- 525 educators through professional development experiences

Vision:

Inspire and motivate our children to achieve their full potential in the fields of science, technology, medicine and engineering.



STEM Learning Ecosystems



- Identifies 15 cross-sector collaborations among schools, out of school time and science-expert organizations (including MSI)
- The Museum's approach has been identified as a successful STEM Learning Ecosystem (Kathleen Traphagen & Saskia Trail, 2014)

School Support Programs



Student Experiences
Science Teacher Education
Science Leadership Initiative

Out of School Time Programs



Youth Development
After School Science
Summer Learning

School Support Programs: *Student Experiences*

- 13 Learning Labs
- 20,000 3rd-12th grade students
- Pre- & post-visit resources connect labs to classrooms
- Address new US Next Generation Science Standards (NGSS)

Goals:

- Increase student content knowledge in specific science subject areas
- Engage students in the scientific process and build scientific habits of mind
- Provide insight into real-world applications of science and introduce students to science-related careers



School Support Programs: Science Teacher Education

Goals:

- Improve teachers' science content knowledge
- Increase teachers' use of hands-on & inquiry-based strategies
- Build teachers' use of external resources

Program Basics:

- 4th-8th grade teachers with limited science experience
- High needs schools (~60% CPS, 40% non-CPS)
- Academic year courses and summer institutes
- Over 1000 teachers from 375 schools since 2006
- >40% of Chicago Public Schools (K-8)
- *NGSS = essential focus*



School Support Programs: Science Leadership Initiative



Goals:

- Identify the components that lead to effective science education
- Support schools to improve
- Promote a culture of shared leadership between MSI, teachers and administrators
- Recognize those who succeed as models for other schools.

Progress to Date:

- Development of School Support Tool
- Pilot (6 partner schools)
- 1st Cohort in 2015 = 15 partner schools
- 2nd Cohort in 2016 = 15 new schools
- Each School Partner commits to three years of participation

Out of School Time Programs: Youth Development



Goals:

- Provide diverse youth with access to science learning experiences
- Open pathways for youth to pursue post-secondary education and consider STEM-related careers
- Position youth as ambassadors for science learning in the Museum and in the community

Program Details:

- 300 high-school youth, ages 13-18
- School year = 30 Saturdays (full day)
- Summer = paid 5 week, full-time internship

Out of School Time Programs: After School Science

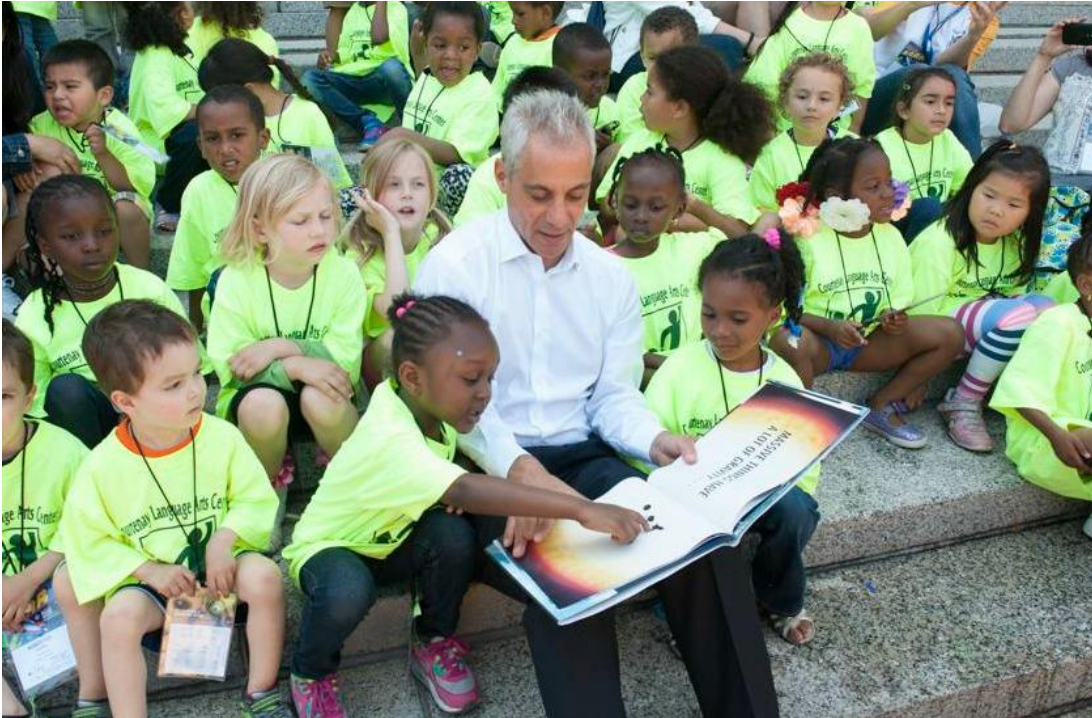
- Reaches ~12,000 students, 8-12 years of age
- 275 educators from 130 partner organizations
- Opportunities for family engagement

Goals:

- Build a presence for science within communities
- Expand the capacity of partner organizations to integrate science learning into existing programs
- Engage children and youth in science learning beyond the traditional school day



Out of School Time Programs: Summer Learning



Goals:

- Build the capacity of libraries to integrate STEM learning into existing summer reading programs
- Establish a presence for the Museum in 80 library branches throughout Chicago
- Provide children and families with the resources to support continued learning during the summer

- 700 library staff; 80 children's librarians received 36 hours of STEM professional development
- Program takes place in libraries, summer camps and family homes
- Largest city summer learning program in the United States
- Over 100,000 children from across Chicago participated in the Summer Learning Challenge in 2016

Research and Evaluation

- 6 member internal Research & Evaluation Team at MSI
- Partner with external researchers (universities, Research and Development firms, etc.)

Examples

Science Teacher Education

- Partnership with Michigan State University
- Experimental study to investigate impact of MSI program on teacher science content knowledge
- Results indicate the MSI's science teacher education program significantly improves teachers' science knowledge and their students' performance in science

Youth Development

- Partnership with University of Virginia and funded by the National Science Foundation
- Retrospective study of prior participants and 5 year quasi-experimental longitudinal study of current participants
- Study follows participants leaving the program through college and into the workplace to determine the effect of MSI program on participants' college and career choices.

Conclusion

Through strategies that:

- Extend learning beyond the walls of museums
- Expand access and opportunities for youth and families
- Support improved science teaching and learning in our schools and communities



Informal learning institutions (such as museums) can inspire and motivate the next generation to:

- Participate as members of a competitive and capable workforce equipped with technical & quantitative skills to succeed in the global marketplace
- Invent creative solutions to pressing issues facing our world—climate change, energy independence, health and safety, etc.
- Make fundamental discoveries about our world and ourselves & develop technological advancements that will shape the future



Contact Us!

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