STEM JOY Pedagogy

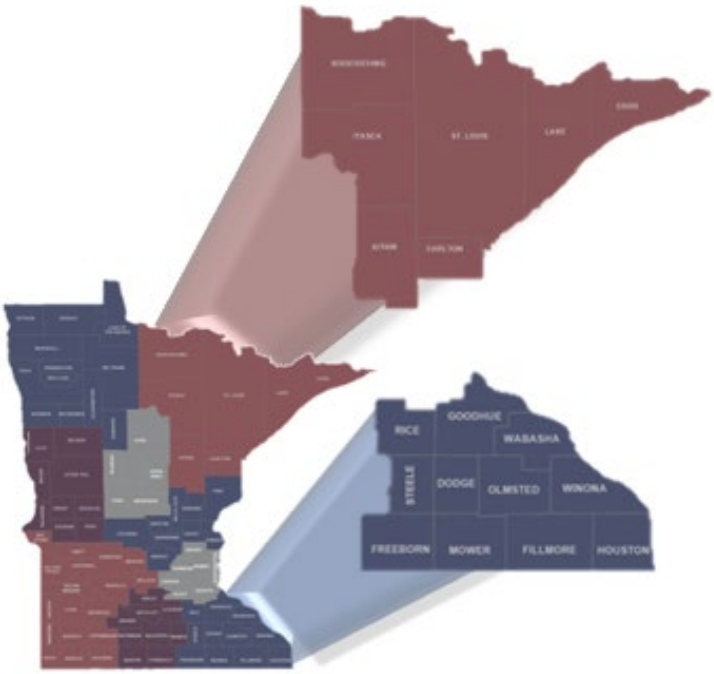
A Collaboration of the Minnesota STEM Ecosystem, the Science Museum of Minnesota, the Southeast Service Cooperative, the Northern Lights Collaborative and Ignite Afterschool.

The workforce is calling and it's clear that we need to address the underrepresentation of women and people of color in STEM. The growing importance of the STEM field and the significant gaps in representation have directly shaped a worldwide call for increased capacity in the STEM workforce.

The Minnesota STEM Ecosystem, Southeast Service Cooperative, the Northern Lights Collaborative, and Ignite Afterschool partnered with the Science Museum of Minnesota (SMM) through the Kitty Anderson Youth Science Center (KAYSC) to pilot the equity-centered STEM JOY training to reframe STEM learning to be more inclusive and socially relevant. STEM JOY is based off of the KAYSC STEM Justice program. It emphasizes inclusivity and addresses barriers to participation for historically marginalized groups. The program is a movement that involves educators, employers, innovators, and community organizers who are imagining alternative and relevant approaches to education, empowering young people, and pushing the boundaries of adult perceptions of youth capabilities in advancing social change.

Participants move through the three-day training: moving from a focus on Self, to Systems, and ultimately to a Shift in Practice. At the conclusion of the STEM JOY training, participants receive ongoing support through coaching and mentoring provided by the Science Museum of Minnesota (SMM) to support their efforts as a STEM JOY practitioner.

The pilot of the program took place in two very distinct regions: Southeast region of Minnesota hosted through the Southeast Service Cooperative; the Northeast Region hosted through the Northern Lights Collaborative.



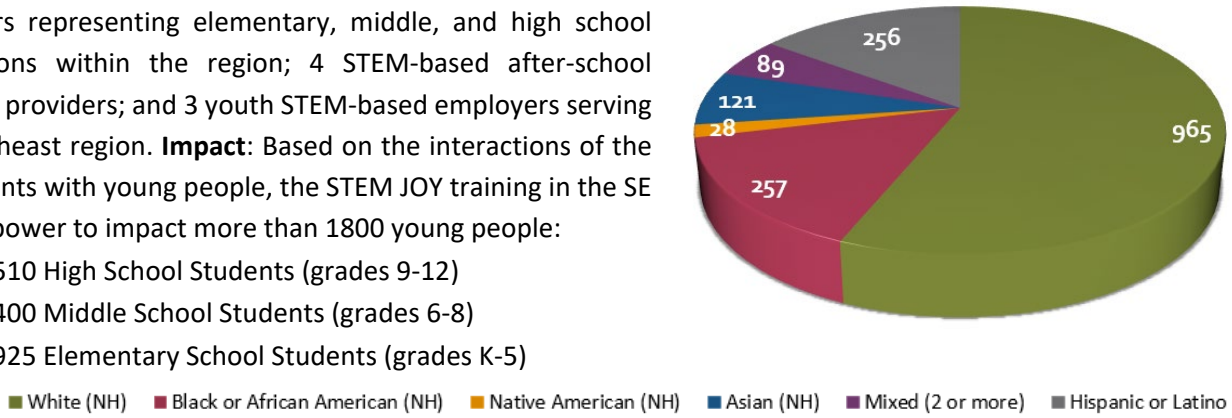
For too long, formal STEM educators, after-school STEM program providers, and youth-based STEM employment program providers have operated in silos, separated into distinct ecosystems. STEM JOY was designed to bridge these gaps and be relevant for all partners within the STEM learning space.

This regional approach allowed participants to address local needs and leverage local resources, fostering a more integrated and sustainable approach to STEM education.

Our Primary Objective: Support formal, after-school and/or work-based learning STEM providers participation in STEM JOY training and coaching. **Secondary Objective**: Enable participant organizations to apply the STEM JOY model and redesign their programs to encourage and increase the participation of girls and young people of color.

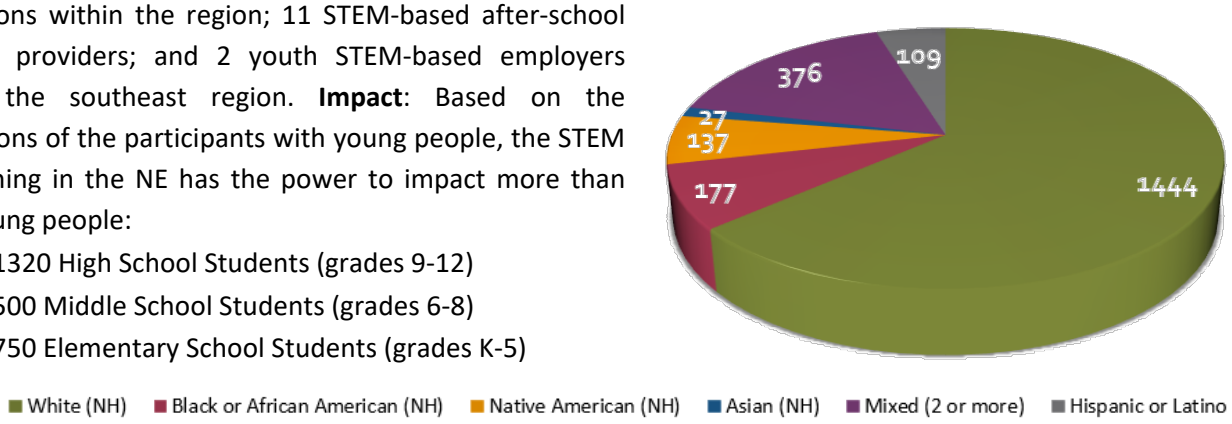
The STEM JOY training in the Southeast (SE) region occurred on February 6, 2024; February 13, 2024 and February 20, 2024. In the Northeast (NE) region it occurred July 22-24, 2024. Each day included 4 hours of structured training. The SE cohort included 18 registrants: 11 formal educators representing elementary, middle, and high school populations within the region; 4 STEM-based after-school program providers; and 3 youth STEM-based employers serving the southeast region. **Impact**: Based on the interactions of the participants with young people, the STEM JOY training in the SE has the power to impact more than 1800 young people:

- 510 High School Students (grades 9-12)
- 400 Middle School Students (grades 6-8)
- 925 Elementary School Students (grades K-5)



The NE cohort included 23 registrants: 10 formal educators representing elementary, middle, and high school populations within the region; 11 STEM-based after-school program providers; and 2 youth STEM-based employers serving the southeast region. **Impact**: Based on the interactions of the participants with young people, the STEM JOY training in the NE has the power to impact more than 2000 young people:

- 1320 High School Students (grades 9-12)
- 500 Middle School Students (grades 6-8)
- 750 Elementary School Students (grades K-5)



Following the training, participants were surveyed to gauge the effectiveness and impact of the information. The results were overwhelmingly positive, highlighting the program's relevance and its potential for practical application. Here are some key findings:

- Over 93% of the participants agreed or strongly agreed: The ideas and concepts we explored in this program felt relevant to me. *This high level of agreement indicates that the training content resonated well with the participants, addressing their needs and interests effectively.*
- Over 89% of the participants agreed or strongly agreed: I feel confident that I can apply the ideas and concepts we explored in this program to my work going forward. *The training not only provided theoretical knowledge but also empowered participants with practical skills and confidence to implement what they learned.*

By integrating the STEM JOY model, this initiative has successfully reframed STEM learning to be more inclusive and socially relevant. Through place-based education, participants were able to connect theoretical concepts with real-world applications, fostering a deeper understanding and appreciation of STEM subjects with a historical context of STEM Learning.

KAYSC STEM justice framework

The survey results from the training underscore its impact, with over 89% of participants gaining a better understanding of the intersection between STEM and social justice. Additionally, a significant majority of participants expressed confidence in applying the concepts learned and intended to implement these ideas within their own programs.

As we look to the future, it is clear that the principles of STEM JOY will continue to inspire and drive positive change. By empowering educators, connecting students with their communities, and emphasizing the importance of diversity and inclusion, the STEM JOY training program has laid a strong foundation for a more equitable and innovative STEM education landscape. This initiative not only enhances the skills and knowledge of participants but also contributes to the broader goal of building a diverse and capable STEM workforce that can meet the challenges of the 21st century.