

# smART::ART Integrated Formal and Informal STEAM Education

## Purpose

Engineering is an inherently creative process. The smART project seeks to engage underrepresented populations in those creative processes and in so doing, generate a better understanding of the interrelated domains of engineering, science, technology and visual art. Research has shown that some individuals avoid STEM engagement due to fear and/or lack of exposure to STEM concepts in their early years. Often these same individuals self-select into the arts. Moreover, the engineering workforce lacks gender and racial/ethnic diversity, which limits its creative potential. To explore this issue, this project uses an arts-oriented approach within a multi-cultural after-school setting to create a more diverse pool of students and teachers who are STEM literate and STEM comfortable. The project has produced a comprehensive arts-integrated STEM curriculum for middle-school informal learning environments.



## Impact

The project's significance extends beyond creating a replicable engineering-art integrated set of activities or curriculum. It is in the process of developing a research-based model for addressing three critical challenges in today's K-12 schools:

(1) Attending to the STEM learning needs of underrepresented populations and diversifying participation in the future engineering workforce.

(2) Teaching design and engineering skills across the curriculum to meet the related demands of the Common Core State Standards in math, Ohio's New Science Learning Standards, and college/career expectations.

(3) Integrating the creative arts into science to expand students' spatial thinking skills as well as their imagination and innovation capacities in authentic interdisciplinary ways.

### Ohio State Colleges/Units Involved

Mechanical and Aerospace  
Engineering  
College of Engineering  
- Engineering Education  
Innovation Center  
Minority Engineering Program  
College of Education and  
Human Ecology

### Community Partners Involved

COSI  
Diversity, Inclusion & Partnerships  
Teen Programming  
Beta by Design 501(c)(3) education  
organization  
Hilltonia Middle School  
Columbus City Schools  
Metro Early College Middle School



### How you can get involved:

- Forum attendees can support our work by attending their culminating exhibit at COSI on May 27th from 5pm-9pm. All are welcome!

### To get involved, contact:

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