

Introduction

- There continues to be a need for the representation of women in science, technology, engineering, and mathematics (STEM) fields. To address this need, the Girls Excelling in Mathematics and Science (GEMS) research team at Purdue started a GEMS club at Low Wallace School in Indianapolis, referred to as Indy GEMS Club.
- Our team consists of graduate research assistants Maria Eloisa Nuguid and Yi Zhu, undergraduate research assistant Grace Gochnauer, and Dr. Elizabeth Suazo-Flores.
- Participating in this club allowed us to connect with the Indianapolis community and also grow as researchers. We are advocates of STEM identity development, spatial thinking, and interactive activities.

Community Impact

- Indy GEMS Club was the first Purdue-affiliated after school experience at Low Wallace School. According to the Indiana Department of Education, 87.5% of students at this school are economically disadvantaged. We worked with a group of ethnically and racially diverse girls.
- Research shows that body-based learning activities involving actions like building and tinkering contribute to students' development of a mathematics identity as doers of mathematics.
- The girls at Indy GEMS Club actively participate in mathematics and science activities using their own ways of knowing and being, which strongly contribute to making STEM a meaningful experience.
- We argue that Indy GEMS Club benefits the community and students by providing opportunities for girls to identify themselves as doers of STEM in rich, hands-on, and interactive activities.

Tasks

Joined by Low Wallace teacher, Amy Sun, the Purdue GEMS team and 14 third and fourth grade girls engaged in informal STEM activities. The Indy GEMS Club girls communicated, collaborated, and most importantly had fun doing STEM in an environment that is different from a traditional classroom setting.

- **Hidden Legos:** Girls worked in pairs with a folder divider between them. One girl built a structure, and her partner rebuilt the structure only given verbal directions.
- **Cup Stacking:** Girls created a pyramid shaped stack of cups without using their hands. The girls were additionally given rubber bands and string to help with stacking.
- **Zipline:** Girls created ziplines out of cups and coffee filters to transport various objects like toys, rocks, and golf balls. They also used different strings like yarn, cotton, and fishing line.
- **Water Filter:** Girls built water filters outside by layering cotton balls, charcoal, sand, gravel, and rocks in a water bottle. They tested out their water filters by repeatedly pouring dirt water into the filter until it was clear.



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