

# Assessing & Improving Girls' and Womens' Math Identity



**BASS CONNECTIONS**  
Education & Human Development

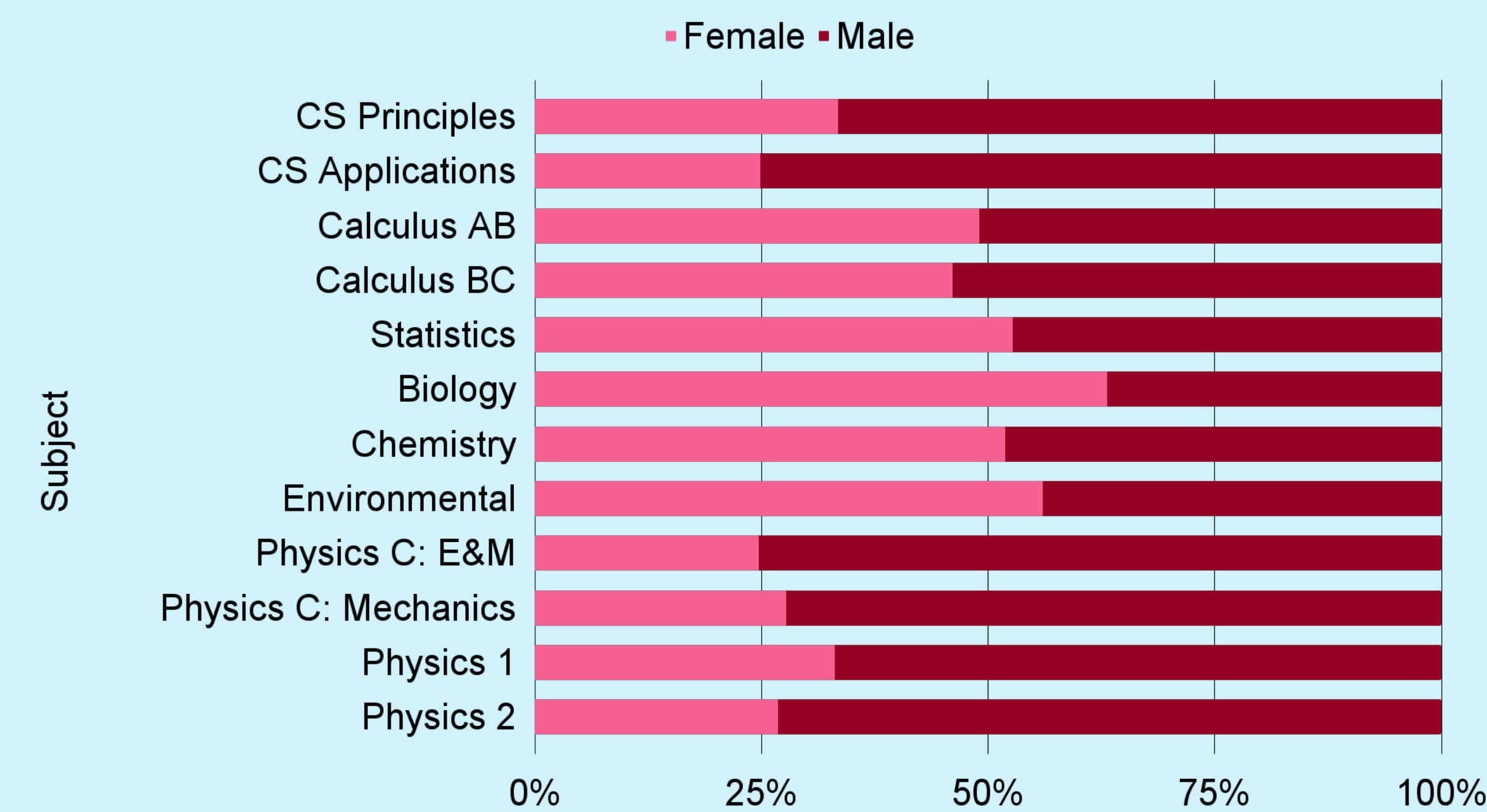
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## Women in STEM

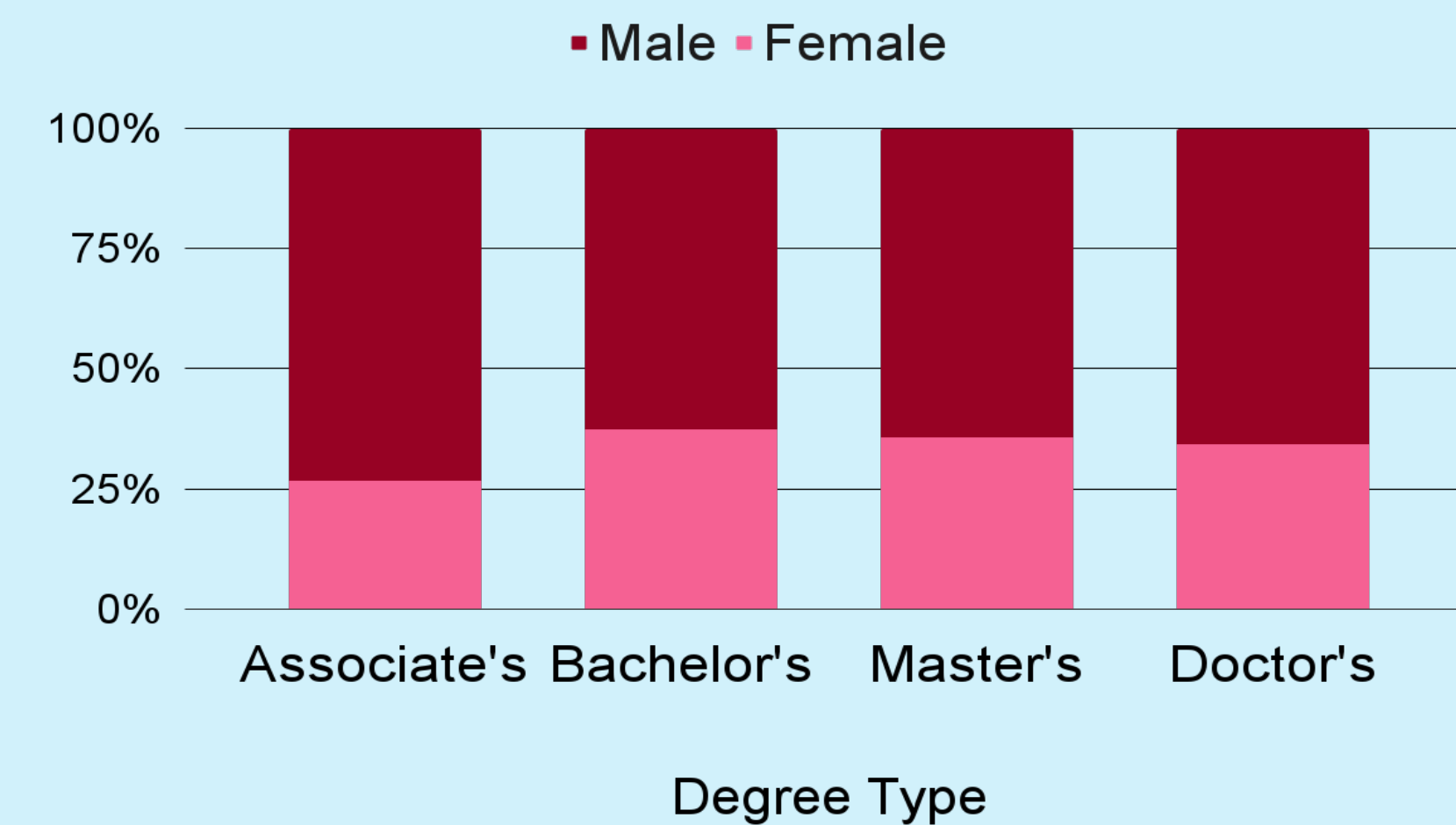
Women are underrepresented in STEM fields at a variety of levels

Students Taking AP Exams in STEM Fields by Gender



North Carolina students who took AP exams in STEM subjects during the 2020-2021 school year (pictured above). National data of degrees awarded in STEM subjects during the 2019-2020 school year (pictured right).

STEM Degrees Awarded by Gender



## Methods

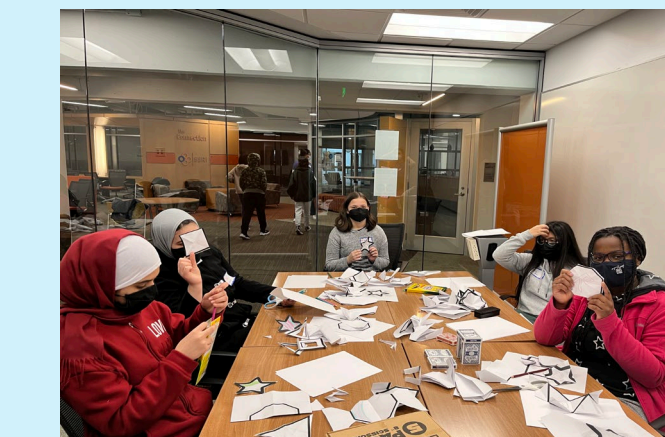
- Young women are encouraged to explore math during two-hour workshops from Jan-Apr, along with longer summer workshops
- Girls participate in problem-based math activities guided by 2-3 mentors
- Mentors discuss cultural factors known to influence students' identities including stereotype threat, self-assessment, gender norms, beliefs about intelligence (fixed vs. growth mindset), and other subjects
- Changes in math ability and mindset following the workshops are assessed through pre- and post-tests

## What is GEM

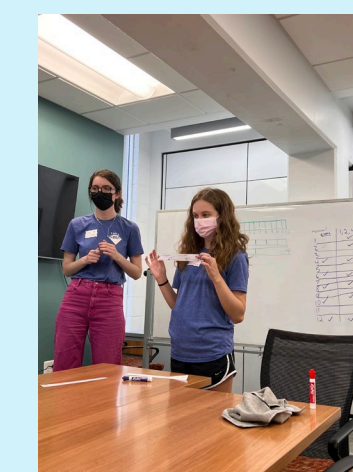
- Stands for **Girls Exploring Math**
- **Weekend and summer workshop** program for middle schoolers
- Develop **problem solving skills** through math activities outside of standard curriculum
- Focus on improving **spatial reasoning**
- **Female mentors** majoring in a variety of STEM fields.
- **Gender discussion** during workshops
- Free and open to all local middle school girls

## From Virtual to In Person

- Mentors design workshops for middle schoolers
- First few workshops conducted over Zoom due to pandemic
- Remaining workshops in person
- Increased engagement throughout the course of workshops



Students solving math activities during in-person and Zoom workshops



Mentors leading a math activity

## Research

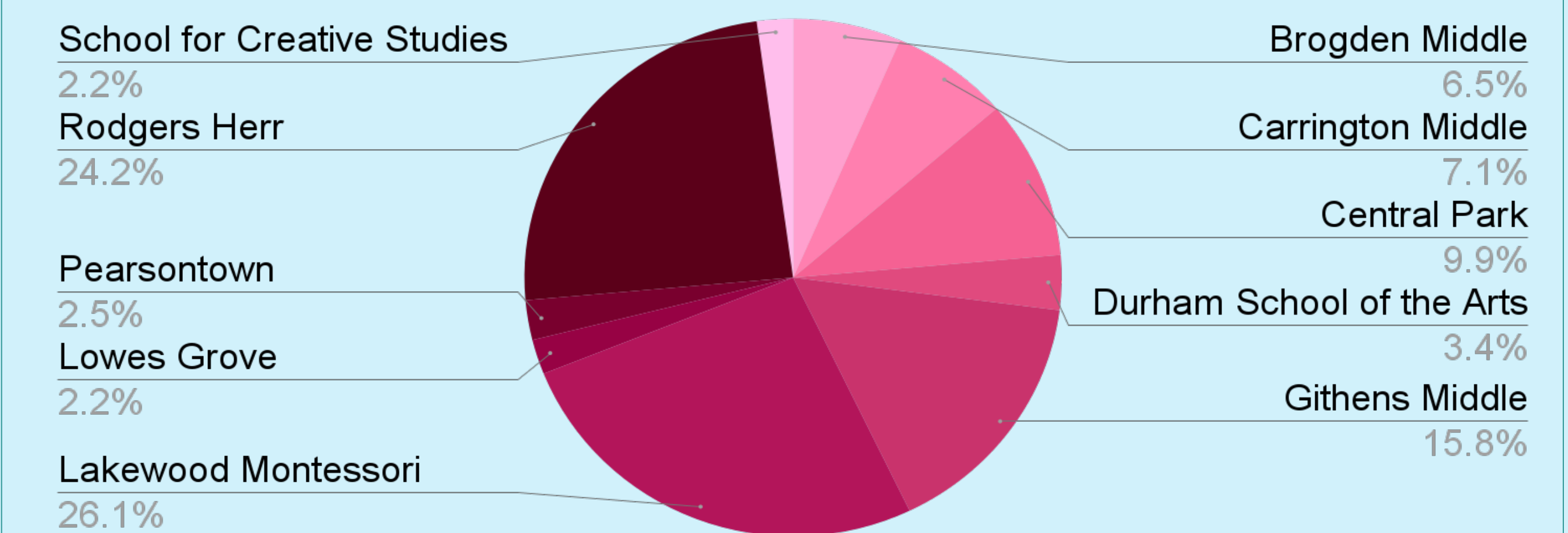
- Survey questions for women in STEM about their experiences. Questions focus on inclusion and femininity
- Pre-survey and post-survey questions for participants. Questions focus on beliefs about performance in math and reading.

## Participants

- Average of 35 participants per workshop

Grade Level	6th	7th	8th
<b>Number of Participants</b>	21	14	20

Schools of Participants



## Timeline



## Communication

- **Weekly newsletters** sent to parents and guardians. Includes example math problems and additional materials
- **Instagram Account (@dukebassgem)** with pictures of participants doing the math activity

## Future Directions

- Develop a **scalable workshop model** to implement program in other universities, particularly in rural areas
- Assess a **control group's perspective** of women in STEM
- Reach out to past participants to determine **long-term impacts**