Girls in STEM

• Intro

• Case Studies
  • Explora, Albuquerque
  • Children’s Creativity Museum, SF
  • Others

• Small Group Discussions

• Resources
  • National Girls Collaborative Project
“★★★★★”

ANN HORNADAY | THE WASHINGTON POST

HIDDEN FIGURES

NOW PLAYING

#HIDDENFIGURES
Stereotypes about Girls and Women in STEM Persist

THE TECH UNIFORM

HAIR: I woke up like this.

GLASSES: If glasses, Wirey Parker. If sunglasses, Rayban.

TEE: A t-shirt from another startup that implements your API. "Can be exchanged for a button up on Thursdays.

MESSENGER BAG: Though practical and smart, messenger bags should be labeled as to not get accidentally swapped at a company happy hour. *same applies for Swiss Army backpacks*

JEANS: These dark wash jeans are void of dirt or any evidence of outdoor use.

SNEAKERS: These blue shoes broadcast both your financial success and ability to still keep it real.

HOODIE: Handle branded with the tech company you worked for. Subtly says "I matter.

WEARABLES: A Pebble or Apple. Tracking your steps from the mission to Soma.

FACIAL HAIR: Varying degrees of beard growth. It is entirely enviable to go full beard.
Tech Girls! Camp

Creating opportunities for inspirational discovery and the joy of lifelong learning through interactive experiences in science, technology, engineering, art, and math.
Tech Girls!

- 2-day spring break coding camp
- 16 girls
- Grades 4th-8th
- First year offering this camp
- One of our fastest camps to fill
1. Girls benefit from collaboration, especially when they can participate and communicate fairly.

2. Girls are motivated by projects they find personally relevant and meaningful.

3. Girls enjoy hands-on, open-ended projects and investigations.

4. Girls are motivated when they can approach projects in their own way, applying their creativity, unique talents, and preferred learning styles.

5. Girls’ confidence and performance improves in response to specific, positive feedback on things they can control—such as effort, strategies, and behaviors.

6. Girls gain confidence and trust in their own reasoning when encouraged to think critically.

7. Girls benefit from relationships with role models and mentors.

www.scigirlsconnect.org
Micro:pet Project

- Interview each other on ideal pet
- Design and build pet for their partner
- Get feedback and iterate
- Incorporate Micro:bit to allow for interaction

- Collaborative
- Open-ended
- Creative
- Relevant
- Specific feedback
Role Models and Mentors

• While lead developer of the camp was a male, the camp was co-taught with female staff and interns
Future Plans

• Refine activities to create more opportunities for collaboration among girls
• More female role models and mentors
• Extend to week long summer camp
• Work with libraries to create coding clubs for girls
To nurture creativity and collaboration in all children and families.

Carol Tang, Ph.D.
Executive Director
Girls’ Programming

- California Girls in STEM network
- Girl Scout
  - Workshops (fee-based)
  - Outreach event
  - STEM badges

- Girls’ Summer Camps
Global excitement for Making is growing, with Maker spaces, fairs, and online and in-person communities emerging in California, across the country, and around the world. However, there are substantial disparities in who participates in these venues.

- Surveys show that over 80% of Makers are men, reflecting the same kind of gender imbalance found in most tech companies. This has significant implications for the kinds of ideas and inventions produced.
- Women more often describe their path into Making as through arts and crafts; men through the physical sciences and engineering.
- Women use terms like artist, designer, creator, or crafter; men with hobbyist, do-it-yourselfer, and builder.
- Female Makers are more often motivated by a desire to help others; men by a love of problem solving.

What is the Maker Movement?
The Maker Movement extends the do-it-yourself approach into technology, inviting people to create new devices and/or adapt existing ones to new purposes. It covers many disciplines, including scientists, engineers, programmers, artists, crafters, cooks, jewelers,
Makers

• 80% are men
• Make Magazine: before 2013,
  – only 15% of covers were women
  – 0% people of color

Dayton, 2017; Buechley, 2013
Castilleja Idea Lab
Designing Girls’ Makerspace

• 2019 Summer Camp
  – Two weeks
  – 15 girls
How to Draw Women into the Maker Movement
Taking Steps to Address Disparities in the Emerging Maker Movement

http://cccspecialpopulations.org/Publications/CCC_SpecPopsWomenMaker.pdf

• Broaden the Definition of Making
• Offer Open-Ended, Versatile Instruction
• Emphasize the Human Benefits of Making
• Build Inclusive Maker Communities
DRAWING WOMEN INTO THE MAKER MOVEMENT

A literature review by Elizabeth Dayton, Ph.D.

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   a) Broaden the definition of Making..........................................................22
      • Encourage interdisciplinary education that bridges STEM fields with arts, crafts design, and other broadly appealing endeavors
      • In so doing, be led (but not limited) by women’s existent interests
      • Combat the perception that women are generally less interested in Making
      • Develop multiple paths to first engaging with new technologies
      • Identify familiar materials to first engage students
      • Encourage documentation of the design process in addition to the physical processes of making
      • To allow for more flexible learning and broader involvement, avoid tightly scheduled and heavily sequenced course structures
   b) Offer open-ended, versatile prompts.........................................................28

Engaging Families

Parents play a vital role in raising youth awareness of the value of STEM and in brokering youth participation in activities that build STEM interest and skills.

For organizations that truly want to move the needle for youth in STEM, culturally responsive family engagement must be more than an add on to programs and funder strategy. Especially for girls and underrepresented youth of color, family engagement is essential to successful STEM programming, wherever informal STEM takes place. Including

Promising Practices

Spotlight 1: 4 Tips to Engage Parents and Caregivers

Spotlight 2: 3 Tips to Involve Parents in STEM Events

Spotlight 3: The Where Matters

Spotlight 4: 3 Tips to Bringing STEM Home

Spotlight 5: 3 Tips to Encourage Girls in STEM

https://stemnext.org/engaging-families/
Camp

• **Week 1**
  – Team building
  – Visiting makerspaces
  – Role models
  – Hands-on activities

• **Week 2**
  – Design teams
  – Model building
  – Family event
  – Share designs
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Designing with Gender in Mind

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Girls & Exhibits
The EDGE Design Attributes

EXHIBIT LABELS

- Use drawing
- Image of a person

EXHIBIT LOOK-AND-FEEL

- Familiar object
- Homey, personal, homemade, or delicate
- Playful, whimsical, or humorous

EXHIBIT INTERACTIONS

- Multiple stations or sides
- Space to accommodate three or more people
- Visitors can watch others to preview
- Open-ended

https://www.exploratorium.edu/education/research-evaluation/edge
Girls & Programs
can teen
a kit for the girl who wants to Change the world
girls, math & science partnership, a program of Carnegie Science Center in Pittsburgh, PA
Girls & Media

Messages
The Opportunity
Between the lines - approaching gender in our museums

1. Open-ended outcomes (and ways to challenge, encourage, and celebrate)
2. Battling perfectionism and giving permission
3. Trying on new identities: affirming, intersectional, ever-changing
4. Comfy and approachable, familiar settings
5. Risk taking, Fail-forward (and maybe embrace the mess)
6. Tell tall tales of the impossible dreams
7. See it. Be it.
Small Group Discussions

- Evaluation/Research
- Recruiting Girls
- Engaging Families
- Fundraising/Messaging
- Improving an Existing Program