## Welcome to the
## NGCP National Webinar

**Making STEM Meaningful for Girls**

Wednesday, May 6, 2020

Please respond to the poll below:

1

## Vision

The National Girls Collaborative Project **brings together organizations** committed to informing and encouraging girls to pursue careers in science, technology, engineering, and mathematics (STEM).

2

## NGCP Goals

1. **Maximize access** to shared resources within organizations interested in engaging girls in STEM.
2. **Strengthen the capacity** of programs by sharing exemplary practice research and program models.
3. **Use the leverage of a network** to achieve gender equity in STEM.

3

## NGCP Activities

**Virtually:**
- Distribution and Content Projects
- ***The Connectory – Collaboration Tool***
- **FabFems –** *Role Model Tool*
- E-Newsletter and Social Media
- Webinars – *Exemplary Practices*

**Local Collaboratives:**
- Professional Development: *Conferences and Forums*
- Incentives to Collaborate: *Mini-Grants*
- Newsletters and Local Resources

4

## National Network of Collaborative Teams

Existing Collaboratives

5

## SciGirls

scigirlsconnect.org
pbskids.org/scigirls

*SciGirls* is an Emmy Award-winning PBS Kids show funded by the NSF that
- Features *real* girls doing STEM investigations they're passionate about;
- Highlights science and engineering processes;
- Features *real* female STEM professionals as role models and mentors

6

## Rationale

### Why do we still care about girls and STEM?

- Boys and girls do not display a significant difference in their **abilities** in STEM. The cause is social and environmental.
- Differences consistently appear in girls' **interest** and **confidence** in STEM subjects, starting at a very young age.
- These differences can be linked to a **negative self-perception**, enhanced by stereotypes.

7

## The *SciGirls* Approach

**On TV**
- National PBS Kids series – Seasons 1-5 are airing now Season 6 in is production (funded by NASA)

**Online**
- A PBS Kids website with videos, games and role model profiles (pbskids.org/scigirls) and on the PBS Kids Video App

**On the Ground**
- STEM activities and professional development for 200+ partners and 3,600 trained educators, and hundreds of *SciGirls-affiliated* role models on *FabFems*.
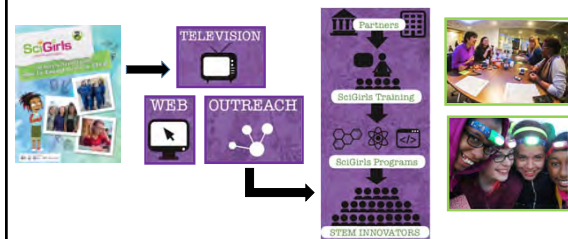
8

## *SciGirls* Research to Practice Model

- *SciGirls* uses **research-based strategies** proven to engage girls in STEM to create media + outreach programs
- Five PBS seasons feature STEM role models working with real girls on **meaningful STEM projects**
- *SciGirls* CONNECT has trained over 3,600 educators in gender equitable teaching strategies, resulting in more than 1,600 youth programs for 101,000 girls (and boys!)

9

## *SciGirls* Research to Practice Model



10



Our approach is grounded in research-based strategies that motivate girls around STEM engagement and include:

11

scigirlsconnect.org

Download videos, activities, and other resources to enhance your program!

12

## Making STEM Meaningful for Girls

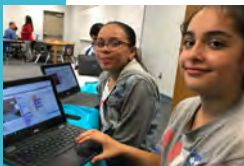Bright spots and lessons learned

13

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1. Connect STEM experiences to girls' lives



14

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Snapshots: Community Projects

Technovation Challenge

EngineerGirl Ambassadors

15

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Lessons learned

- Facilitation is a balancing act
- STEM skills are only the beginning
- Motivation matters (a lot)
- Girls with promise: Setting them up for success

16

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What it takes to support #1

- Supporting mentors and volunteers
- Monitoring projects and knowing when to pivot
- Supporting project management
- Maintaining a humble approach to learning from what's not working

17

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5. STEM is collaborative, social and community-oriented

18

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**Slide 19**

Snapshot @ Techbridge Girls



19

**Slide 20**

Lessons learned

- Groupings matter, even more with long-term projects
- Community-building isn't just nice to have
- Feeling safe to make mistakes and take risks

20

**Slide 21**

What it takes to support #5

- Icebreakers are non-negotiables
- Monitoring dynamics
- Opportunities for girls to self-reflect
- Training beyond STEM skills

21

**Slide 22**

Resources

Reframing "Failure" in Making: The Value of Play, Social Relationships, and Ownership

Making and Mentors: What it Takes to Make Them Better Together

Strategies to Keep Your Mentoring Programs Active-Lessons from Technovation

K-12 Pair Programming Toolkit

Bridging Differences: How Social Relationships and Racial Differences Matter in a Girls' Technology Program

22

**Slide 23**

The updated SciGirls Strategies Guide

- A team of 6 from SciGirls systematically collected and examined 130 peer-reviewed articles with a focus on K-12 settings from 2013-2017 using keywords associated with STEM broadly and STEM fields specifically.
- Published in 2018

23

**Slide 24**

Do girls feel like they belong? STEM identity is important

**How do we define STEM Identity?**

- STEM identity requires opportunities to develop competence in STEM-related skills, perform these competencies, and be recognized by perceived experts (Carlone & Johnson, 2007).
- the importance of recognition by peers, teachers, and family in the three spheres of middle school: home, school, and out of school. (Calabrese Barton et al., 2013).

24

## Slide 25

**What does the literature say?**

**1. Connect STEM experiences to girls' lives**

- Engaging girls in activities that draw on their culture, interests, perspectives, needs, knowledge and lived experiences helps them to develop a STEM identity and increases their sense of belonging in STEM
  - (Bonner & Dornerich, 2016; Erete, Pinkard, Martin, & Sandherr, 2016; Stewart-Gardiner, Carmichael, Latham, Lozano & Greene, 2013; Civil, 2016).

25

## Slide 26

**What does the literature say?**

**5. STEM is collaborative, social, and community-oriented**

- Girls benefit from collaborative environments that recognize the need for a sense of group membership or collective community
  - (Capobianco, Ji, & French, 2015; Diekman et al., 2015; Leaper, 2015; Riedinger & Taylor, 2016; Robnett, 2013),
- especially when they can participate and communicate in collegially nurturing safe spaces.
  - (Parker & Rennie, 2002; Scantlebury, Baker, Sugi, Yoshida, & Uysal, 2007; Werner & Denner, 2009).

26

## Slide 27

**Resources**

Cracking the Gender Code: Get 3x More Women in Computing

MakeHers: Engaging Girls and Women in Technology through Making, Creating Inventing

Changing the Game for Girls in STEM: Findings on High Impact Programs and System-Building Strategies

27

## Slide 28

### Discussion

1. How do you learn about the interests and lived experiences of girls and how do you incorporate these insights into your programs? How do you account for differences among girls?

2. Training and ongoing support is important to help staff support these SciGirls strategies (#1 Connecting STEM experiences to girls' lives and #5 Emphasizing how STEM is collaborative, social, and community-oriented). What are some specific ideas and strategies for how you have successfully supported staff in this work?

3. In response to COVID-19, how are you re-imagining your programs and supporting girls with activities that connect to their lives and that are collaborative and community-oriented?

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28

## Slide 29

### Upcoming NGCP Webinars

**Girls STEAM Ahead with NASA Free Resources**
Wednesday, May 20, 2020

**CryptoClub: Exploring Mathematics in a Playful and Engaging Way**
Thursday, May 21, 2020

**Equity in STEM Education: The Connection to Culture**
Wednesday, May 27, 2020

**Register on the NGCP Website**

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29