Welcome to the NGCP National Webinar

Celebrate Computer Science Education Week with SciGirls!

Tuesday, December 8, 2020

Please respond to the poll and introduce yourself in the chat.

Use the chat to ask questions, respond to one another, and share resources.
NGCP 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).
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 models.

3. **Use the leverage of a network** to achieve gender equity in STEM.
NGCP Activities

Increased Collaboration Benefits Girl-Serving STEM Programs

- Helped us better serve girls: 82%
- Increased girls’ interest in STEM: 78%
- Helped my program be more effective: 77%
- Increased girls’ confidence in STEM: 77%

Source: NGCP 2015 Annual Survey
National Network of Collaborative Teams
SciGirls Speaker:

Katie Hesson
Science Producer and Senior STEM Content & Outreach Specialist, Twin Cities PBS
SciGirls Strategies:
How to Engage Girls in STEM

Katie Hessen khessen@tpt.org
STEM Content Specialist and Science Producer, Twin Cities PBS
SciGirls: The Big Idea

Media and education that change how girls see STEM and how the world sees girls.
SciGirls is....

On-air
★ A national PBS Kids series (with over 46 million viewer impressions to date) with 39 full-length episodes and 28 role model profiles

Online
★ A PBS Kids website with videos and games (300,000 visitors/month)
★ On the PBS Kids Video App (with over 60 million views online!)

On-the-ground
★ SciGirls gender equitable professional development and STEM activities
★ SciGirls network of 200 SciGirls partners in 35 states
★ 1200 programs reaching 82,000+ youth!
On TV

- **HIGH TECH TIDE**
- **SUPER SENSORS**
- **CARTOON CODERS**
- **GAME CHANGERS**

New episodes starting December 12th.
CS Content from SciGirls

Media
★ 5+ episodes of SciGirls centered on computational thinking (Emmy Nominated!)
★ Role model profile videos (3-5 minutes)

Activities
★ Unplugged activities suitable for formal and informal learning spaces (new: Hour of Code!)
★ Coming Soon: 32 hr curriculum using Micro:Bit

Games
★ https://pbskids.org/scigirls/games
★ CodeQuest – For beginners, code Subby the submarine to learn about the ocean floor

www.SciGirlsConnect.org
Search more green kelp for hidden animals.

Search all the kelp in one code sequence to complete the mission.

Move code blocks here, then hit the play button to run them.
Rationale
What does it all mean?

- Boys and girls do not display a significant difference in their abilities in STEM. The cause of the gender gap 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.
The SciGirls Strategies

The SciGirls approach is rooted in research about how to engage girls in STEM. 25 years of research have converged on a set of common strategies that work, and they have become the framework for SciGirls.

http://www.scigirlsconnect.org

All SciGirls Activities have been updated to reflect the new strategies!
SciGirls Strategies: How to Engage Girls in STEM

The SciGirls approach is rooted in research about how to engage girls in STEM. A quarter of a century of studies have converged on a set of strategies that work, and they have become the framework for SciGirls.

1. Connect STEM experiences to girls’ lives.
2. Support girls using STEM practices.
3. Empower girls to embrace struggles.
4. Encourage girls to challenge STEM stereotypes.
5. Emphasize that STEM is collaborative and community-oriented.
6. Interact with diverse STEM role models & mentors.

In order to be effective at implementing the SciGirls Strategies, educators need to:

Provide an inclusive learning environment.

TIPS:
- Create a warm and welcoming space that is accessible to all.
- Create an atmosphere of mutual respect.
- Use icebreakers so youth can introduce themselves in a non-threatening manner.
- Provide opportunities for youth to voice their opinions.

Use culturally responsive teaching practices.

TIPS:
- Understand your culture and how it affects others.
- Get to know your youth and build on their life experiences.
- Communicate high expectations for behavior and performance.
- Validate youth’s bilingual abilities to leverage learning.

www.scigirlsconnect.org
Framing the SciGirls Strategies

- **STEM for ALL** Learning Environment
- Culturally Responsive Teaching Strategies
STEM for All Learning Environment

- Create a warm and well decorated space that fosters cooperation and acceptance
- Learn about youth’s needs
- Practice and encourage active listening
- Use icebreakers
- Create an atmosphere of mutual respect
- Provide opportunities for youth to voice their opinions and feel accepted
Culturally Responsive Teaching

*Lifelong* process of using *cultural knowledge*, *prior experiences*, and *performance styles* of diverse students to make learning more appropriate and effective for students. (Gay, 2013)
Culturally Responsive Teaching

Surface Culture
(Observable)

- Customs
- Language
- Music
- Holiday traditions
- Food
- Manners
- Gestures
- Religious rituals
- Sports
- Clothing
- Literature

Deep Culture
(Non-observable)

- Concept of justice
- Concept of beauty
- Definitions of sin
- Notions of modesty
- Motivations
- Working styles
- Approaches to problem solving
- Handling of emotions
- Communication styles
- Rules of social etiquette
- Rules of relationships
- Concept of fairness
- Religious beliefs
- Ideas of cleanliness
- Importance of time
- Gender differences
- Differences between public and private
- Attitudes to rules
- Tolerance for change
- Personal space
- Learning styles
STEM for all learning environment and culturally responsive teaching practices frame all of the *SciGirls* Strategies.
1. Connect STEM Experiences to Girls’ lives

• Create experiences that allow girls to explore issues or topics they care about and that impact their lives, families, or communities to help girls see the relevancy of STEM.

• Include posters, materials, and examples that reference girls’ communities and experiences; for instance, posters of STEM professionals who mirror the girls.

• Allow time for reflection throughout the activity. You might ask girls to write in a journal or talk with each other about connections to their lives.
2. Support girls using STEM practices.

- Engage girls in hands-on, inquiry-based STEM experiences that incorporate practices used by STEM professionals.

- STEM Practices: asking questions and identifying problems, planning investigations, making predictions, building and testing models or prototypes, analyzing data and constructing explanations, and sharing results and solutions.
3. Empower girls to embrace struggle.

- Teach girls that working through problems and having experiments fail is a normal part of the scientific and engineering process.
- Provide time and space for girls to grapple with and process ideas before stepping in to provide support and direction.
- Ask questions that get at the process of learning rather than a finished product.
- Provide feedback on things girls can control—such as process, strategy, behavior.
4. Encourage girls to challenge stereotypes

- Provide examples of what STEM looks like for professionals. Help girls understand the stereotypical STEM professional (working alone on a computer or in a lab) is not what many people experience in their own work lives.
- Incorporate materials, images, and content that counter stereotypes about who does STEM.
- Provide opportunities for girls to work together, support each other, and connect with STEM-minded peers.
- Point out that doing STEM and being a STEM person does not contradict how girls see themselves or their aspirations for the future.
5. Emphasize that STEM is collaborative, social, and community-oriented.

• Provide opportunities for girls to collaborate successfully and help them understand the benefits of collaboration.
• Give girls ownership in the process by designing meaningful team roles that are intellectually engaging and provide opportunities for each girl to contribute to the learning process.
• Create a supportive learning environment by helping girls get to know each other, make connections, and feel comfortable sharing their ideas.
• Share examples of how STEM offers opportunities to work with others, help others, and give back to the community.
6. Interact with diverse STEM role models and mentors

• Incorporate role models who are supportive, engaging, and relatable who mirror the diversity in your population.

• Encourage role models to describe their career path, what their work looks like and how their work benefits others. Ask them to talk about their personal lives as well, including their hobbies, interests, pets, and families.

• Provide opportunities for girls to engage with different types of role models like STEM professionals, educators, parents, and near peers (high school or college students).
FabFems is an international, online, searchable directory of women STEM professionals interested in outreach to girls

** Audience:**
- Role Models
- Girl-Serving Programs
- Parents and Girls

www.fabfems.org
Educator resources on scigirlsconnect.org

Download videos, activities, and other resources to enhance your program!
Looking for more?

Katie Hessen, khessen@tpt.org

SciGirls Activities, Videos, and more: scigirlsconnect.org

scigirlstv  @SciGirls

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Questions and Discussion

• How have you been teaching computer science in your virtual setting?

• How are the SciGirls strategies evident in your computer science or STEM education practices?
Thank You!

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