

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



NATIONAL GIRLS COLLABORATIVE PROJECT

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

Produced by:



Made Possible by:



Additional Support from:



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



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



forward

turn left


turn right

action

cam



Search more green kelp for hidden animals.
Search all the kelp in one code sequence to complete the mission.

when  pressed

Move code blocks here,
then hit the play button to run them



FISH 2



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.

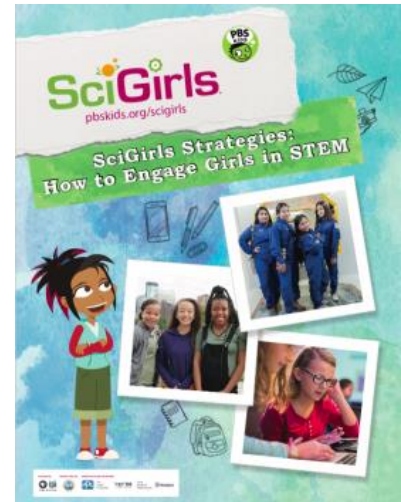


The SciGirls Strategies

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 being 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.

Framework for the SciGirls Strategies

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

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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
Works of art Clothing Literature

Deep Culture
(Non-observable)

Concept of justice Concept of beauty
Definitions of sin Notions of modesty
Approaches to problem solving Motivations Working styles
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
Personal space Tolerance for change
Learning styles

Framing the SciGirls Strategies

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 Website

FabFems is an international, online, searchable directory of women STEM professionals interested in outreach to girls

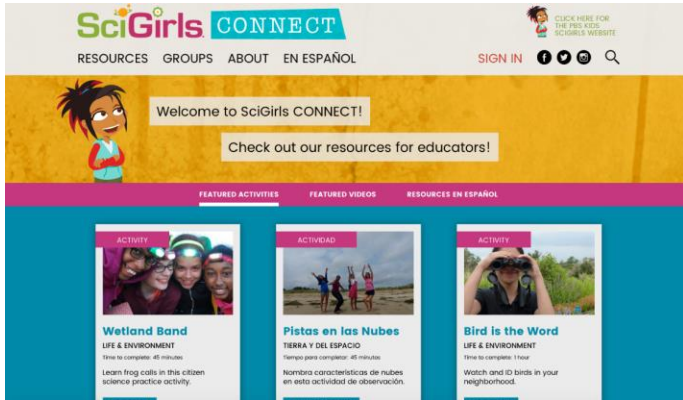
Audience:

- Role Models
- Girl-Serving Programs
- Parents and Girls

www.fabfems.org

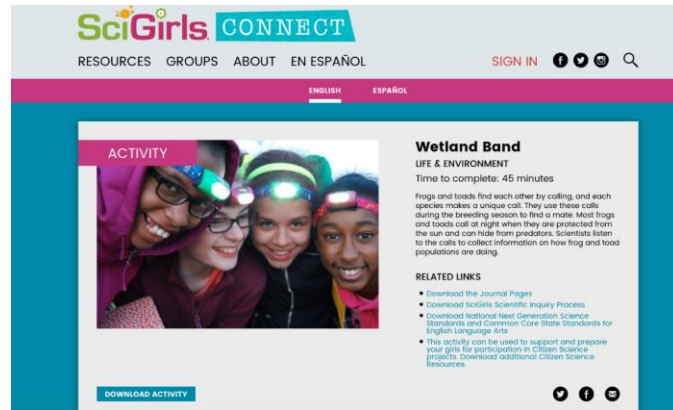


The screenshot shows the FabFems website homepage. At the top, there is a navigation bar with links for "About Us", "Resources", "Contact Us", "Log In", and "FAQ". Below this is a purple header with the "FabFems" logo and a "Connect with us" button featuring a Facebook icon. The main content area has a pink background with the text "Share your past. Spark a future." and two buttons: "Find a Role Model" and "Become a Role Model". To the right is a photo of a smiling woman holding a folder. Below this is a section titled "About FabFems" with a small photo of two women in a lab. The text describes FabFems as women from various STEM professions who are passionate, collaborative, and work to make the world a better place. It mentions that many girls have similar interests but aren't connected to adults who exemplify the STEM career pathway. The text concludes with "This is where you come in. Create a FabFems profile to expand girls' career options, dispel stereotypes and spark their interests - just by being you." and a link to "Learn More About the FabFems Project".



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

Educator resources on scigirlsconnect.org



Looking for more?

Katie Hessen, khessen@tpt.org

SciGirls Activities, Videos, and more: scigirlsconnect.org



scigirlstv



@SciGirls



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SciGirls



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?

SciGirls



Computer
Science
Education
Week

Thank You!

- Visit us at: ngcproject.org
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