Tips for Using the SciGirls Strategies

In the next several pages, we offer practical tips for implementing the SciGirls Strategies. You do not need to incorporate all the strategies into an activity to improve girls’ STEM identities. Practice introducing one or two techniques each time you do an activity and discover what works best for your group.

1. Connect STEM experiences to girls’ lives.
   - Ask girls about their backgrounds, interests, and community to better understand how to connect STEM to their lives, or have girls choose the topics they want to explore.
   - 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 as they investigate questions and solve problems using STEM practices.
   - Provide opportunities for girls to engage in scientific and engineering practices such as 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.
   - Provide opportunities for girls to engage in hands-on STEM activities that incorporate scientific and engineering practices and that are open-ended (ones that have several right answers and many ways to get to them).
   - Provide opportunities for girls to use everyday language to make sense of science terminology. Use their language when you reiterate points.
   - Make direct connections between STEM activities and the work of STEM professionals so girls understand they are doing real STEM work. They’ll be able to envision themselves as someone who does STEM.

For more information go to scigirlsconnect.org

STEM identity refers to a person’s sense of who they are, want to be, and what they believe they are capable of in relation to STEM. For more information, see page 6.

For additional resources on STEM practices look at A Framework for K-12 Science Education from the National Research Council (2012).
Empower girls to embrace struggle, overcome challenges, and increase self-confidence in STEM.

- 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 (for example, how did you get to that answer? or how did you decide what step to do next? or I like how you connected your learning to this activity).
- Provide feedback on things girls can control—such as process (problem solving, critical thinking, information processing, communicating results), strategies (trying new approaches to solve problems, reverse engineering, switching perspective, collaborations), and behaviors (effort, persistence, challenge seeking).

Encourage girls to identify and challenge STEM 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. For example, display posters of diverse women and highlight those whose work benefits the community.
- 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.

Use SciGirls episodes and role model videos to showcase peers and adult women who are challenging the STEM stereotype. Visit scigirlsconnect.org/resource_topic/role-model-profiles/ for access to a wide variety of videos.
#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.

Icebreaker: Four Corners
Pose a question to the group. (For example: What is your favorite season—winter, spring, summer, or fall?) After asking the question designate one season to each corner of the room and instruct girls to go to the corner representing their answer. Once everyone is settled, invite them to share why they like that season best. Continue the activity by posing additional questions.

“Whenever you come together with a team, you can find the answer to any question.”
- Josie, Age 12
Provide opportunities for girls to interact with and learn from diverse STEM role models.

- Incorporate role models who are supportive, engaging, relatable, and who mirror the diversity in your population.
- Invite role models to be guest speakers, host a ‘Women in STEM’ panel, and provide opportunities for girls to engage in hands-on activities with role models.
- 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).

The FabFems directory is a national database of women in STEM professions who are inspiring role models for young women. The directory is accessible to young women, girl-serving programs, and other organizations working to increase career awareness and interest in STEM. Search for role models, or become a FabFem, by visiting fabfems.org.

Meet a few of the SciGirls Mentors!

Dr. Omayra Ortega, Professor of math at Arizona State University

Krystan Wilkinson, Data Scientist

Alma Stephanie Tapia, Metallurgical and Materials Engineer at NASA.

Orietta Verdugo, Industrial Engineer