

The SciGirls Strategies

Proven Strategies for Engaging 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 common strategies that work, and they have become the framework for **SciGirls**. The original set of strategies, created in 2010, were updated in 2019 to reflect current research.

1

Connect STEM experiences to girls' lives.

(Boucher et al., 2017; Sammet et al., 2016; Bonner & Dornierich, 2016; Erete et al., 2016; Stewart-Gardiner et al., 2013; Civil, 2016; Verdine et al., 2016; Cervantes-Soon, 2016).

Make STEM real and meaningful by engaging girls in activities that draw on their interests, knowledge, skills, culture, and lived experiences. This helps girls develop a STEM identity and increases their sense of belonging in STEM.

2

Support girls as they investigate questions and solve problems using STEM practices.

(Buckholz et al., 2014; Kim, 2016; Scott & White, 2013; Farland-Smith, 2016; Munley & Rossiter, 2013; Civil, 2016; Riedinger et al., 2016)

Engage girls in hands-on, inquiry-based STEM experiences that incorporate practices used by STEM professionals. Let girls take ownership of their own STEM learning and engage in meaningful STEM work to positively impact their identities and re-define how they see STEM.

3

Empower girls to embrace struggle, overcome challenges, and increase self-confidence in STEM.

(Blackwell et al., 2007; Dweck, 2000; Halpern et al., 2007; Kim et al., 2007; Mueller & Dweck, 1998)

Help girls focus on and value the process of learning by supporting their strategies for problem solving and letting them know their skills can improve through practice. Support girls to develop a growth mindset—the belief that intelligence can develop with effort and learning.

4

Encourage girls to identify and challenge STEM stereotypes.

(Allen et al., 2017; Carli et al., 2016; Cheryan et al., 2015; Robnett, 2016; Allen et al., 2017; Carlone et al., 2015; Sammet et al., 2016; Scott et al., 2014; Tan et al., 2013; Dasgupta et al., 2014; Verdine et al., 2016; Civil, 2016; Boucher et al., 2017).

Support girls in pushing against existing stereotypes and the need to conform to gender roles. Helping girls make connections between their unique cultural and social backgrounds and STEM disciplines will negate potential stereotype barriers.

5

Emphasize that STEM is collaborative, social, and community-oriented.

(Capobianco et al., 2015; Diekman et al., 2015; Leaper, 2015; Riedinger et al., 2016; Robnett, 2013; Parker & Rennie, 2002; Scantlebury & Baker, 2007; Werner & Denner, 2009; Cakiret al., 2017; Sammet et al., 2016; Boucher et al., 2017; Clark et al., 2016; Leaper, 2015)

Highlight the social nature of STEM to increase interest and motivation and change the stereotypical perception that STEM jobs require people to work alone. Girls benefit from a supportive environment that offers opportunities to build relationships and form a collective identity.

6

Provide opportunities for girls to interact with and learn from diverse STEM role models.

(Koch et al., 2015; Leaper, 2015; Adamset al., 2014; Jethwaniet al., 2017; Kessels, 2014; O'Brien et al., 2016; Levine et al., 2015; Hughes et al., 2013; Cheryan et al., 2015; Weisgram & Diekman, 2017)

Introduce girls to diverse women role models from varied STEM career pathways to help girls see potential futures and develop resilient STEM identities. Positive role models can increase girls' interests in, positive attitudes toward, and identification with STEM.