

Sisters eSTEAM: It's not just about the science, it's about the whole girl

By Venneasha Davis

What is Sisters e S.T.E.A.M.?

Sisters e S.T.E.A.M. attempts to connect the activities and practices of culturally-relevant inquiry-based science instruction with the identified elements of science achievement, critical thinking skills, and prosocial behaviors. Specifically, Sisters e S.T.E.A.M. provides students with opportunities to understand science in real world contexts, develop research questions, conduct hands-on experimentation, discuss research experiments, learn to work and interact cooperatively, and present findings in multiple ways to different audiences.

Designed as an inquiry-based hands-on science program, participation in Sisters e S.T.E.A.M. exposes young women to STEAM content that promotes personal and academic learning. Designed primarily for African American females and females situated in poverty, Sisters e S.T.E.A.M. provides a culturally-relevant science curriculum that transforms the way that girls understand and approach the STEAM careers. Primarily delivered as an after-school program in Woodland Hills and through pop-up programs throughout Allegheny County, Sisters e S.T.E.A.M. utilizes real world applications to connect girls to science content that is aligned to the PA Core Standards and the Next Generation Science Standards.

Sisters e S.T.E.A.M. transforms the way that young women look at the STEAM careers; generally introducing young women to a successful experience with science for the first time. This program is designed for young women who typically do not have the opportunity to engage in science enrichment programs. Currently, six core units are delivered in an after school program format two days per week. The units are: Hair & Cosmetic Chemistry (Beautistry), Newton's Laws of Motion through Dance, Ecological BioDiversity, Thoughts & Bots (Robotics), and Lights! Camera! Action! (Photography) & Biology.

In addition to science content, Sisters e S.T.E.A.M. also supports the social and emotional wellness of its female students. Using peer mentoring and youth empowerment as foundational principals, Sisters e S.T.E.A.M. seeks to reduce girl on girl disruptions (e.g., fighting, bullying, disengagement) throughout the school day.

How do you create culturally responsive STEAM activities?

Watch the *Sisters e STEAM* video of a panel discussion of Black girls discussing their program focusing on self Esteem, Science, Technology, Engineering, Arts, and Math (e STEAM) in an after school program for middle school Black girls. The founder and director Venneasha Davis, talks with alumni of the program about the life-long impact of the program. The panel discusses the culturally relevant activities that extended beyond the school walls and how they cultivated a safe, positive, nurturing community where the girls thrived in eSTEAM.

Founder and Director	Venneasha Davis
Student 1	Taylor Moore
Student 2	Aishia Hoots
Interviewer	Dr. April Warren-Grice

Watch how Sister ESTEAM founder and student alum discuss the following:

- How to cultivate the mindset to create a culturally responsive space
- How to build relationships with students
- How to connect with students
- How to cultivate spaces that students want to be in
- How to create real world application
- Examples of STEAM activities

Guiding Questions

After watching the video, consider the following questions?

1. What resonated with you?
2. What did this video spark in you or inspire you to think about?
3. What was an Aha moment for you while watching this video?
4. What is 1 thing you will do as a result of watching this video? Explain.

Don't have time to watch the video? Here is the cheat sheet with what we learned based on the video.

To create a culturally responsive space teachers must do the following:

Develop a critically loving teacher mindset

Teaching is much, much bigger than just teaching the material. Teachers must

- Like students.
- Appreciate each student for what they bring into the space, community, and world.
- Believe in each student.
- See them in the future and what they can become.
- See, connect, and speak to their spirit.
- See the healed version of themselves.
- Support them in becoming the best version of themselves.
- Practice “[critical love grounded in justice for oneself and all communities.](#)”
- Get to know the families and communities.
- Appreciate the process of educating.
- Love teaching.
- Be willing to be innovative to reach each student.
- Make learning fun.
- Teach in ways that connect to the student.
- Be open to loving your student.

Cultivate a community that students want to be a part of by building and cultivating healthy and life-long relationships

- Ask your students what they want. Match their ideas with the standards to show that science is in everything.
 - Ask: If you could learn anything that you want to learn, what would it be?
- Create a community of trust where girls feel safe, and loved.
 - Create space where interventions can take place with students and teachers
- Consider how girls, especially Black and Brown girls, are perceived and treated (due to racism, sexism, xenophobia, heterosexism, ableism, classism, colorism, lookism-whose faces and/or bodies fit social ideals, sizeism/fatphobia, ageism, colonialism and other forms of oppression), and create a space where they can see and believe that Black and Brown girls can do STEAM.
 - Consider the culture of each girl and consider how you might connect it to the curriculum.
 - Be intentional about the curriculum of self development and weave in self-esteem building activities. In the video they discuss several activities, such as, not limited to:

- Yoga
 - Did You Know? I Sure Didn't - a way for girls to talk about their day
 - Mirror Mirror in My Hand: What's my reputation and where do I stand?
Purpose: to understand about reputation works and giving the students agency to determine how they want to be seen in the world.
 - Creative arts related activities such as Spoken Word which allowed them to learn about themselves.
- Support the students outside of the space.

Make learning relevant with real world application

- Students participated in Beautistry - connecting beauty products with chemistry. Students made their own soap, deodorant, and lipstick. They made an entire set of lipstick aligned with the periodic table.
- Students were hired to conduct science projects at kid birthday parties. Making lipstick is an example. This is also an example of entrepreneurship and students were able to make money leading the birthday parties.
- Students made sustainable farms.
- Students participated in Wreck the Tech, where they had 24 hours to make a space for kids. Students turned a raw space into a huge operating room focusing on the heart and cardiovascular system. Students led activities where they dissected a heart, focused on keeping a healthy heart. Each child participant wore surgical caps during the event.
- Students taught younger children.
- Students used 3d printing (it's not just for the gifted students)

Create memorable moments and allow them try new things throughout the year

- Girls had to apply to join the club
- Students went hiking, white water rafting, and Ziplining

Other Examples of STEAM activities

- Photography and lights
- Prisms and lights
- Science fairs and STEAM competitions, like K'Nex STEM

Sister eSTEAM In the News Highlights

- [Fisher Scientific](#)
- [Remake Learning](#)
- [IQ Smart Parent: Girls in Media](#)
- [Social and Emotional Learning](#)

Sisters eSTEAM TOOL for Culturally Responsive Teaching in eSTEAM

Let's get started. Use this tool to develop your own culturally responsive unit, lesson, or program.

GUIDE	NOTES
<p>Student Interest Knowing a student's interest provides an avenue for success. Ask:</p> <ul style="list-style-type: none">• <i>If you could learn about anything, what would it be and why?</i>• <i>What are some things that excite you, make you smile, think, laugh?</i>• <i>If you could discuss a topic in this class, what would it be and why?</i>	
<p>Skills What skills/standards do students need to know and master?</p>	
<p>Connect the Dots Connecting student interest with the subject standards/skills is key.</p> <ul style="list-style-type: none">• The line between the dots must be engaging yet maintain rigor.• Engage students with rich vocabulary allowing them to strengthen their communication skills (verbal, nonverbal, written, and visual)	
<p>Innovative Thinking Once students have begun to understand the skill, take their interest a step further to get students to reimagine what this topic could look like in the future. Ask</p> <ul style="list-style-type: none">• <i>How does this look through a cultural lens, economical lens, environmental lens?</i> Discuss the pros and cons.• <i>What are the historical connections?</i>• <i>When thinking further into the future how can this benefit people that look like you and other marginalized communities?</i>	