

SciGirls in Space

*SciGirls in Space:
Exploring the Moon, Mars and NASA Careers*

Implementation Evaluation

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Executive Summary

Implementation

- 16 educational organizations from the SciGirls CONNECT network of partners signed on to be partners for the project from 13 states. Two dropped out due to the pandemic just prior to implementation and one was able to be replaced in time.
- Partners included: The Ramapo Challenger Learning Center, NY; The Challenger Learning Center of Maine, ME; The Pisgah Astronomical Research Institute, NC (with Rosman Middle School); The Science Center of Iowa, IA; Exploration Works, MT; The North Dakota Space Grant Consortium, ND; Girls Inc. of Tennessee Valley, TN; WSKG, NY; The University of Montana spectrUM Discovery Center, MT; Basic Enhancements, GA; The Challenger Center of Northern Nevada, NV; Project Scientist, NC; The National High Magnetic Field Laboratory, FL; The Reading Public Museum, PA; and The Scobee Education Center, TX.
- In April 2022, TPT trained 23 informal educators from 15 educational organizations to integrate *SciGirls in Space* activities and media resources into existing girl-serving STEM programs. Three-quarters of the educators had done *SciGirls* programs before. They were certified teachers (10), informal educators (3), undergraduates (1), and science communicators (1). 71% of girls had not seen *SciGirls* television shows before.
- These educators then implemented *SciGirls in Space* with 369 youth (exceeding our original goal of involving 320 girls); with educators reporting 299 family participants and 43 NASA STEM professionals acting as program role models.
- The learners attending the program ranged in age from 8 years old (4%) to 14 (3%) with the majority being between 10 (20%) and 13 (18%) with 8% Hispanic. Most girls self-reported as being “white” (75%) or African American/Black (11%), Native American Indian or Alaska Native (8%), Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, or Asian (7%); 95% identified as a girl.
- Programs ranged from one four-hour session to ten 60-minute sessions for a total of 62 sessions and 96 hours of programming.
- Community types ranged from urban (5), to suburban (4), rural (3), and mixed (3).
- Institutions varied: science centers (7), schools (5), community centers (1), libraries (1), and museums (1).
- Some partners faced challenges with recruitment and others had time constraints regarding implementation. In response to these challenges some partners did additional programming and plan to offer *SciGirls in Space* in the future when other competing programs are not running.
- Girls signed up because they were interested in STEM, were encouraged by someone, and to have fun and explore STEM. Girls reported liking the program a lot (4.3/5), especially the science, learning with others, and the snacks.
- Girls reported they could relate somewhat to the girls in the *SciGirls in Space* role model videos featuring four high school and two college girls who participated in International Space Science (ISS) projects and two NASA career women (77%).
- Families (N=58) reported that their girls liked the *SciGirls in Space* program “a lot” (74%), “quite a bit” (24%) and “a little” (2%) and many said they would look for more opportunities like this for their daughters.
- NASA role models were engineers, pilots, research scientists, professors, and post-doctoral students. They reported on their visits with girls to the evaluator.

Outcomes

- A majority (67%) of the girls would recommend the *SciGirls in Space* program to another student with another 31% saying “maybe” and only 4% saying “no.”
- All of the families (100%) would recommend the *SciGirls in Space* program to another family describing it as a wonderful opportunity and learning experience that their children enjoyed every day.
- 100% of educators would recommend the *SciGirls in Space* program to others as engaging, easy to use with STEM hands-on activities and *SciGirls* role model videos and *SciGirls* episodes. (Partners were required to use two role model videos and one episode).
- 100% of women STEM role models would recommend the *SciGirls in Space* program to another NASA professional as inspiring, fun, and easy. They reported their visit went well (3.4/4) and the girls were engaged (3.3/4).
- Educators reported good effects on youth who attended the program: interest in STEM (4.2/5), confidence in doing STEM activities (3.9), collaboration with others (4.1), developing STEM knowledge (4.1), and interest in NASA careers (3.9).
- Girls reported learning about many different space science topics from stars and constellations to space travel and astronauts. The girls left wanting to learn more about different space topics, NASA, STEM, and each other.
- Girls reported that they got ideas (59%) for STEM activities they could do in their own lives. Some (66%) were inspired to think about careers at NASA.
- Girls reported significant increases in all areas as a result of the participating in the program: working together (6.3/10 before, 8.1 after), making a difference (5.5, 7.5), asking questions and exploring (5.7, 7.6), being creative and unique (7.9, 9.0), making mistakes (6.3, 7.5), motivating others (6.1, 7.4), and using STEM to solve community problems (4.8, 6.5). They reported that they got better at these things because they had to work as a team, ask questions, continuing to try, and being willing to make mistakes.
- Families wrote about how their daughters enjoyed the experience, how they left wanting to do more, learned a lot, want to pursue a career in STEM and/or NASA, and enjoyed making new friends.
- Families reported that their daughters felt many aspects of the program were important including being creative and unique (4.6/5), asking questions and exploring (4.4), hearing advice from girl role models (4.3), using STEM to solve community problems (4.3), working with a mentor (4.3), and communicating their feelings (4.2).
- Since participating, the girls showed interest in doing more science activities (4.8/5), NASA (4.4), and finding and completing a science challenge (4.4).

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Students in a *SciGirls in Space* afterschool program in South Carolina.

I. Background and Purpose

SciGirls in Space: Exploring the Moon, Mars and NASA Careers combined NASA lessons, subject matter experts, missions, technologies and facilities with the Emmy Award-winning PBS *SciGirls* initiative, which includes a television series, digital resources, educator professional development (PD) and educational outreach for middle school-aged girls and families. To produce a season of NASA *SciGirls* episodes and role model videos for broadcast on public media stations and online streaming platforms, Twin Cities PBS (TPT) collaborated with experts from the NASA HQ, Goddard Space Flight Center, Marshall Space Flight Center, Langley Research Center and Ames Research Center.

The project's goal was to foster increased engagement and retention in NASA-aligned STEM study and career paths among girls ages 8-13 and parents/caregivers and families, particularly learners of color and underserved populations. The project's intended outcomes include an increase in girls' and educators' self-confidence, knowledge and motivation to undertake future NASA learning; and increased parental capacity to support girls' STEM education and NASA career exploration. TPT's objectives are to provide STEM educators with PD in the use of gender equitable and culturally responsive instructional practices (including the use of NASA role models), media resources and activities that highlight NASA space exploration, microgravity and space science; and to collaborate with diverse educational organizations to increase their use of high-quality NASA-aligned resources. Participant's intended outcomes include an increase in girls' and educators' self-confidence, knowledge, and motivation to undertake future NASA learning; and increased parental capacity to support girls' STEM education and NASA career exploration.

All project components worked together in an effort to broaden girls' participation in STEM learning, ultimately preparing more women for NASA and STEM career pursuit. All media features NASA female STEM mentors, facilities and missions, and the role model videos featured near-peers who participated in space-flown experiments and NASA career women. The project's website contained a series of activities aligned with the Next Generation Science Standards and provided educators with NASA-themed lessons that reflected each episode's content. All resources are available in English and Spanish on the main *SciGirls* CONNECT website (scigirlsconnect.org). The project website hosted all resources for educators <https://sites.google.com/view/scigirlsinospace/home>.

An independent evaluation was conducted by Technology for Learning Consortium to inform project implementation (formative evaluation), characterize how sites implement the program, and collect evidence of impact (summative evaluation).

Partners (sites) received training in *SciGirls Strategies* and a stipend of \$2000. TPT connected the sites with role models upon request. They could also use local role models. They were also encouraged to use online videos (<https://sites.google.com/view/scigirlsinospace/role-model-videos>). Program educators received two copies of the *SciGirls Activity Collection* of 50 STEM activities, the *SciGirls Strategies* equity guide, and the *SciGirls Role Model Strategies* guide for local role models. Educators also received 20 copies of the *SciGirls Family Guide for Engaging*

Girls in STEM, and 20 copies of *SciGirls Dare to be a SciGirl!* booklet for girls. The episodes and related activities are shown in the table below.

<i>Episode</i>	<i>Related Activity</i>
Hazards of Deep Space Amaya, Lily and Nikki launch an investigation into the hazards of deep spaceflight	Mission Patch Party Brainstorm design ideas and make sketches to create your own mission patch
Dakota Stars Emily, Wicahpi and Sienna learn how modern science connects to the star knowledge their Dakota ancestors passed down	Imagination Station Design your dream discoveries! What do you think remains to be discovered? Create art that shows your dream discoveries
SkyGirls SciGirls team up with NASA to identify clouds and verify satellite data	Cloud Clues Name cloud characteristics in this outdoor, observational activity
Star Power SciGirls help cut light pollution in their neighborhood	Star Power Create a star show and learn how you can prevent light pollution
Space Squad Texas SciGirls team with a NASA materials engineer to create water bottle insulators	Insulator Innovator Improve your favorite water bottle
Super Sensors Inspired by NASA satellite cameras, SciGirls build and code their own wildlife cameras	Keep Out! Build an alarming doormat to keep siblings out of your room

II. Methods and Measures

This evaluation measured the nature and effects of outreach programming, as experienced by the girls, family members and role models. Evaluation questions were:

- *What is the nature of the implementation of SciGirls in Space? (formative)*
- *What is the effect of the outreach program on girls' awareness and interest in STEM and NASA careers? (summative)*
- *To what extent does SciGirls in Space affect girls' caregivers' support? (summative)*
- *What is the effect on role models? (summative)*
- *What is the reach of SciGirls in Space resources? (summative)*

Effects were measured through self-report surveys of youth, families, and role models and interviews with educators. Educators first completed a survey about their planned use of *SciGirls in Space* resources, their schedules, participants, and their programming. Then the evaluator interviewed them about their program implementation and experiences. Case site studies were completed based on the educator surveys and interviews. They were asked to have participating girls, families, and NASA STEM role models complete surveys at the end of implementation (see Appendix C for measures).

III. Findings

In this section, we report on the characteristics of the funded partner sites, the educator's reflections on the implementation, the youth reflections on the experience, the family's observations of the effects on the youth, and the experience of the role models.

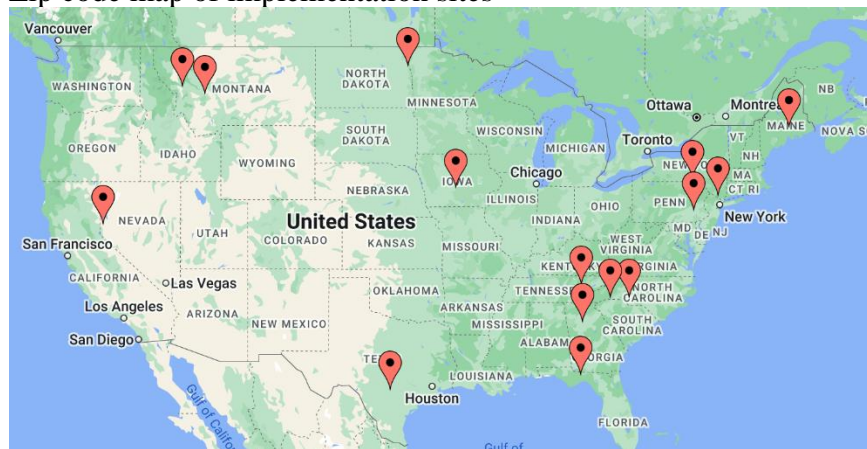
III.A. Sites

Educators provided data on their implementations through surveys and interviews. Each site is characterized in detail in Appendix A. The data is summarized for all the sites in this section.

Funded Partners

- Basic Enhancements Inc. w/Miller Grove Middle School, GA
- Challenger Learning Center of Maine
- Challenger Center of Northern Nevada
- Exploration Works, MT
- Girls Inc. of Tennessee Valley
- National High Magnetic Field Lab at Florida State University
- North Dakota Space Grant Consortium
- Pisgah Astronomical Research Institute, NC (PARI) w/Rosman Middle School
- Project Scientist w/Charlotte-MCK libraries: Allegra, Independence, Sugar Creek, NC
- Ramapo Challenger Center, NY
- Reading Public Museum, PA
- Science Center of Iowa
- Scobee Science Center, TX
- U of Montana spectrUM Discovery Center
- WSKY, NY

Zip code map of implementation sites



Types of programs: 6 afterschool, 6 summer, 2 evening, 1 weekend, 1 summer and afterschool

Community Types: 5 urban, 4 suburban, 3 rural, 3 mixed

Institutions: 7 science centers, 5 schools, 1 community center, 1 library, 1 museum

Staff backgrounds: 10 certified teachers, 3 informal educators, 1 undergraduate, 1 science communicator

Schedules/Formats:

	Min	Max	Median	Average	Total
# Sessions	1	10	4	4	62
Time/session (min)	60	240	95	121	-
Total time (min)	60	720	360	383	5740

Youth and Family Participants 307 girls, 234 family members

	Min	Max	Median	Average	Total
# Youth	6	70	20	25	369
# Family	0	100	12	20	299

Role Models N=43 at 15 sites, including both in person and videos used

	Min	Max	Median	Average	Total
# Role models	1	4	3	3	20*

*connected through *SciGirls*. An additional 23 were recruited by the sites locally or were shown through videos.

III.B. Educator Reflections

Educators responded from all 15 sites to a survey on their implementation of *SciGirls in Space*.

All the partners (100%) would recommend SciGirls in Space because: (more responses in Appendix B)

- *It was great! Materials are cheap, lessons are flexible, students were engaged. We had a wonderful response. We've had in-person events before that weren't so successful with middle school. With elementary, the parents sign them up. We had many more sign up. We think there's interest in girl programming. Also interest in space seemed to be a factor. Hands-on activities were also a draw. Hadn't confirmed role model until halfway through the sign up process. Some of the girls said, I love this show (SciGirls).*
- *SciGirls offers a great range of video and hands-on activity resources to encourage girls to strengthen their view of themselves as being capable of being successful scientists.*
- *It's worth the effort. I've done it for seven years. We use the activities in other camps. The activities really work, for both boys and girls. I'm a SciGirls trainer too and in the trainings I've done people really seem to like it.*
- *I would recommend the program. It has great content and resources to engage girls in STEM. The hands-on activities were enjoyed by our students and they encouraged girls to work together and encourage one another. The connections to the real women in STEM careers and NASA scientists were very beneficial in helping girls make connections to future careers for themselves.*

Educators reflected on the challenges they faced and shared how they addressed them.

Challenges	How Challenges Were Addressed
<i>Recruiting girls to attend/stay, time constraints, facility.</i>	<i>Had trouble over the summer. Used to doing SciGirls over the summer. Been with SciGirls since 2017. Most of the time I would do it in the summer, but this year kids didn't sign up, so I did it with kids who were already here at my school and in the clubs.</i>
<i>Recruiting girls to attend/stay</i>	<i>We were targeting tribal girls and families as we selected the Dakota Stars episode to screen. We sent emails out to different tribal groups and educators, but many did not start to respond until we got closer to the event. I re-sent emails to those I hadn't heard from, but as it was a targeted audience I could not just post an all-call on social media.</i>
<i>Recruiting girls to attend/stay</i>	<i>Recruitment is a huge struggle for SciGirls. The girls who come love it, but don't seem to sign up like students in our other camps. In the past we have gone to visit schools and talked to specific grade levels, which might attract 1 or 2 girls. We haven't had luck with other strategies. We are planning to be more aggressive before school ends in May next year to get more girls. May need to change name since some feedback that "girls only" is not cool.</i>
<i>Recruiting girls to attend/stay, Time constraints</i>	<i>We had a difficult time recruiting girls to attend and stay afterschool. We live in a rural low socio-economic community and with a lack of school/program provided transportation it limited which girls had the ability to stay due to having to ride a school bus. We also had a scheduling conflict come up, where the middle school volleyball team (which had several girls interested in the program) practice times changed which meant they were not able to participate. We also wished we could do more but time seemed limited, with us only having it one week.</i>
<i>Time constraints</i>	<i>We had so much planned and not enough time to do it all. Bringing in mentors was awesome, but then we ran out of time for the paired activity. We just tried to do our best and be flexible. We sometimes sent girls home with unfinished projects. I'd like to have 90 minutes per session so we can do an activity and meet with a role model.</i>
<i>Time constraints</i>	<i>A few more videos would have been good to use. Would do more time on Cloud clues journal; spent a lot of time with role models which the girls really enjoyed. Did a rover experiment so more time on coding.</i>
<i>Time constraints</i>	<i>A restraint was we are not able to finish all that is planned, but it does not seem to hinder the actual programming that is put out to the kids. The flu was going around the last week so they didn't get to do the last week. Managing the classroom while following along with the virtual lessons and communicating between the kids and the teacher on screen is challenging for one person, but we are not able to spare another staff member to help.</i>
<i>Managing participant/ coordination/managing staff, and staff shortages. We also experienced a lot of resistance to space from the girls.</i>	<i>We had big challenges with staffing at this point in the summer. It was very challenging for our educators to facilitate quality STEM experiences when there were a lot of big behavior challenges in the room. We encountered a lot of resistance among campers who were signed up by their parents without knowing what the camp would be about. We struggled to find a balance between play and STEM content. I feel that we overcame this by providing more support, breaking campers into smaller</i>

	<i>groups, and simplifying the lessons to one concept we hoped campers would walk away with. In our second camp, we faced very little resistance and things went very smoothly.</i>
<i>Time constraints, Coordination/managing staff, Facility</i>	<i>The time constraint just refers to the grant timeline. We wanted to do this program with this school - we don't begin school in NY until after Labor day. With school rules of not beginning after school programs the first few weeks of school - this put us into October making the deadline to participate a bit tight for us. I was going to implement this w/ two different after school programs but the second school had issues with getting their afterschool programming off the ground before the grant timeline ended. We still plan on using these activities starting in January of 2023.</i>

Educators' Perceptions of Effects on Youth (1=no effect, 5=great effect)

Area	Min	Max	Median	Average
Interest in STEM	2	5	4	4.2
Confidence in doing STEM activities	2	5	4	3.9
Collaboration with others	2	5	4	4.1
Developing STEM knowledge	3	5	4	4.1
Interest in NASA careers	3	5	4	3.9

Other comments (more in Appendix)

- In addition to our NASA mentor, we also included one of her grad students in our presentation, and we had three female college student interns who helped with activities. The Dakota Stars was so special and it had the art in there too. The girls were asking such in-depth questions of the role model about her work on Mars Mission. She had instruments on a satellite orbiting Mars. She was involved with Perseverance and Opportunity, and involved in the planning of other missions. She didn't have a straight line into her position so the girls were fascinated with that.*
- Our girls who participated this summer in programming really enjoyed this; so much that we are continuing with this group during our fall programming in outreach in the schools (N=60). We are also planning to take a few of the most interested girls from this summer to the space museum in Birmingham AL. We are hoping to stay on site and working to have the entire trip sponsored.*
- I would love to see more activities to choose from in the future. We're always looking for as much content as we can get. I would love to see more activities about space that youth can do in 30-45 minute. Having the activities in one place would also be helpful.*
- It would have been beneficial to have been provided with some resources for recruiting and advertising the program. But overall it went really well.*

III.C. Youth Reflections

Survey responses for sites: Total = 131 Min = 1 Max = 23

Why did you sign up for *SciGirls in Space*?

When asked why they signed-up for *SciGirls in Space*, many educators wrote about being “interested in space”, liking/loving science, that a family member encouraged them, and being brought by their teacher as part of a class. For others it was an opportunity to be with friends and have fun but not all wanted to be there.

To explore and learn about opportunities for a career path in Science and Technology.

I like space and Alivia made me come (but I had fun).

To have a new opportunity.

Because I love science.

Overall, how much did you like it? 1=Not at all, 5=A lot) (N=129)

Mean 4.3/5

What did you like best?

What girls liked best varied as widely as the participants themselves. For some, they liked the topic of the event best (rovers, the planetarium, robotics, constellations) while others were engaged by “creating things”, the activities, and testing what they had made. A number of learners were happy to be with their friends, eating the food and snacks, and working with others.

The friendly, safe and welcoming community.

I liked the activities where we problem solved and I was in Mission Control.

Having the opportunity to do STEM related activities every day.

Meeting the lady that worked at NASA.

I liked working with the other people doing the hands-on activities.

Learning about plans and what other people want to be.

What did you learn about space science?

While some learners simply stated learning “a lot” a number of others were more specific. Their comments included learning about clouds and stars, gravity, rockets, payloads, rovers, space, the Sun, 3D printing, solar cars, constellations, light pollution, space suits, the Moon, moon phases, NASA, the Artemis missions, space exploration, engineering, STEM, female astronauts, solar power, impact craters, and hovercrafts. Others were more abstract in their comments, writing about learning to work with others, sharing ideas, failing and making mistakes, and building friendships.

The first woman is going to the moon.

They have STEM jobs besides being an astronaut.

I never realized how big space is.

That we on Earth can also help with NASA programs.

You can do anything!

What space science topics do you want to know more about?

While none were more common than others, additional space topics that were of interest included constellations, planets, biology, gravity, weather, astronauts, stars, rockets, human health, space, Artemis, the Moon, the planets, being on the ISS, our solar system, NASA, other galaxies, space travel, and “everything.”

How to find constellations

Astronomy, astrophysics, aerospace engineering

How they build rockets

Extraterrestrial life on other planets

I heard about a thing where the Earth blocks the sun from the moon. That sounds cool!

Did you feel you were able to relate to the girls in videos? (N=128)

	N	%
Yes	28	22%
No	29	23%
Some	71	55%

Why or why not? Please explain.

For those who related to the girls in the *SciGirls* episode videos, they felt they shared a common interest, they both liked space, that they were “like them,” by doing experiments, solving problems, the girls were of a similar age, and that they were having fun. For those that felt they could not relate to girls in the videos because they did not see any, not being interested, not being able to follow what was happening, not liking science, or feeling they were not very smart.

Because I care a lot about animals including frogs, so I want to protect them.

They like performing scientific experiments to figure things out.

Because some had the same interests as me.

I like to make things that you can use and that will be helpful.

Because I never give up.

Did seeing the girls give you ideas for things you could do in your own life? (N=103)

	N	%
Yes	61	59%
No	42	41%

If yes, what were some of those ideas?

For those learners who felt that seeing the girls in the videos gave them ideas for things they could do in their own life, they wrote about being more engaged, helping to stop light pollution, creating and designing things, being an astronaut, working at NASA, coding, being an engineer, looking at the stars, learning more about space, getting better at STEM, eating healthy, and getting ideas for making things.

I am going to launch rockets at home.

I believe this can help me get into zoology.

I could find people in my community to help me grow and learn.

I could make stuff for space or learn more about space.

They made me think I could do science projects at home and maybe be some kind of scientist when I'm older.

Did the women in the short videos you watched inspire you to think about a career at NASA or in STEM? (N=122)

	N	%
Yes	81	66%
No	41	34%

Rate yourself BEFORE and AFTER doing SciGirls in Space the following skills on a scale of 1-10. (N=116)

	Before	After
Working together	6.3	8.1*
Making a difference	5.5	7.5*
Asking questions and exploring	5.7	7.6*
Being creative and unique	7.9	9.0*
Making mistakes	6.3	7.5*
Motivating others	6.1	7.4*
Using STEM to solve community problems	4.8	6.5*

*Indicates a significant difference BEFORE to AFTER (p<0.01)

For the skill you learned the most about from the list above, please explain how you got better.

To get better and improve their skills, the girls wrote about learning to work as a team, asking more questions, getting better by continuing to try, that it is OK to make mistakes, listening, having fun, being creating and unique, helping to motivate others, exploring, and building their confidence.

Making mistakes. Before I thought it was good and bad to make mistakes and now I am sure to learn from them.

I learned how to better your community with STEM. before I only thought of big ways that I wasn't able to do but now I see that there are small things you can do to help.

Making things and being creative are my favorite. I like to draw out my ideas before I try to build them. It's easier and more fun to work together when you have a good team.

I used to hang around in the back during group projects and now I participate all the time.

Would you recommend *SciGirls in Space* to another student? (N=107)

	N	%
Yes	72	67%
No	4	4%
Maybe	31	29%

What would you say to them?

When asked what they might say to another student about *SciGirls*, many wrote about telling them it was “fun” and that they would “learn a lot.” Others wrote about making new friends, hearing others’ stories, generating new ideas, becoming a *SciGirl*, and the old stand-by, “Do it!”

SciGirls in Space was an amazing opportunity where I got to learn about my favorite STEM topics, meet cool people in STEM, and overall just do fun STEM related activities.

Other comments or suggestions?

While most did not anything further to share, a few made comments or suggestions that included advertising better, ensuring that everyone gets to see the videos, include additional STEM topics, and being grateful and having fun.

Thank you for making science fun 😊

Tell us about you:

How old are you?

N=99	N	%
8	4	4%
9	10	10%
10	20	20%
11	29	29%
12	15	15%
13	18	18%
14	3	3%

Please check one or more boxes to describe your racial identity N=106

	N	%
African American/Black	12	11%
Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, other Asian	7	7%
Native American Indian or Alaska Native	8	8%
Native Hawaiian or Pacific Islander	1	1%
White	75	71%
Other	3	3%

Other: please describe: *Mexican, Middle Eastern, Puerto Rican*

Do you identify as Hispanic, Latino, or Spanish? (N=105)

	N	%
Yes	8	8%
No	97	92%

What is your current gender identity? (N=87)

	N	%
Girl	81	95%
Trans Girl	1	1%
Gender non-conforming	3	4%
Boy	0	0
Trans Boy	0	0
Different Identity	2	4%

If you chose “different identity” please describe - Gender-fluid (2)

Before the *SciGirls in Space* program, had you even seen any *SciGirls* television shows or videos before? (N=101)

	N	%
Yes	15	15%
No	72	71%
Can't remember	14	14%

III.D. Family Reflections

A total of 58 family survey responses from nine locations ranging from 1-13 surveys per site.

Overall, how much did your daughter like *SciGirls*? 1=not at all, 4=a lot

	N	%
Not at all	0	0
A little	1	2%
Quite a bit	14	24%
A lot	58	74%

What did your child say about *SciGirls in Space* experience?

Families wrote about how their daughter enjoyed the experience, how they left wanting to do more, learned a lot, wants to pursue a career in STEM and/or NASA, and enjoyed making new friends.

She came home every day excited to tell me what happened at camp.

She didn't stop talking about SciGirls for the whole week! She shared everything she did and learned. She also mentioned she wants to work on the mission to Mars.

She is now thinking of working for NASA when it was not really in the top 10 before.

She likes doing experiments with her friends. She likes having special guests come into class.

Did your child mention any of these things as important? 1=not important, 5=very important or DK for don't know

	Min	Max	Median	Average	DK
Working together	2	5	4	4.1/5	4
Making a difference	1	5	4	4.1	12
Asking questions and exploring	3	5	5	4.4	2
Being creative and unique	3	5	5	4.6	2
Hearing advice from girl role models	1	5	5	4.3	7
Learning about the girls' studies	2	5	4	4.0	8
Making mistakes	2	5	4	4.0	8
Motivating others	2	5	4	4.1	9
Using STEM to solve community problems	2	5	5	4.3	10
Working with a mentor	2	5	5	4.3	9
Involving your family members	1	5	4	3.9	7
Communicating your findings	2	5	4	4.2	5

Has your child shown interest in any of the following since participating in the *SciGirls in Space* program? 1=no interest, 5=great interest, or DK for don't know

	Min	Max	Median	Average	DK
NASA	1	5	5	4.4/5	7
Learning about other girls	1	5	4	4.0	8
Finding a mentor	1	5	4	3.8	13
See more SciGirls episodes	1	5	4	4.0	10
Doing more science activities	3	5	5	4.8	0
Find a science challenge	3	5	5	4.4	4

Would you recommend *SciGirls in Space* to another family? YES=100%

What would you say to them about the *SciGirls in Space* program?

Family members wrote that they would tell other families that *SciGirls in Space* is “a great learning experience,” a wonderful opportunity, that their child enjoyed coming every day, supports their interest in space and STEM, and that “Girls need to do this!”

Excellent way to get your girls involved in science. My daughter loved this program.

It is a great way to expose your child to the wonders of science in space.

My child had an amazing time learning about space and would love to do it again.

It is a fun program that encourages girls to look at many new career opportunities. They kept the girls working and engaged.

Other comments or suggestions

Family members offered few additional suggestions with one wanting it to last longer and another not wanting her daughter to be asked gender questions without parental permission. The other comments were mainly those offering thanks for the program and praise for those who ran it.

I will spread the word to other to experience this.

The speaker was fantastic! I wish her talk was recorded to show my students.

We would like to thank the program and everyone for giving our daughter an opportunity to experience the program!

We are so grateful for this program!

III.E. Role Model Reflections (27 trained, 20 matched, 43 used including videos)

All the role models (100%) would recommend being a role model for *SciGirls* suggesting that:

- *It's easier than you think!*
- *Be enthusiastic and willing to go with the flow of discussion topics*
- *It may depend on the venue and teachers. In my case, my interaction was not too rewarding but I would still recommend doing this to colleagues because the girls need role models who look like them in order to be encouraged to pursue STEM careers. I would encourage my colleagues to volunteer. But also, I would make sure they are prepared ahead of time and get the information from the teachers (age range of students, topics they'd need to cover during their interaction, preparing anything in advance, etc.)*
- *Give it a try and keep it simple*
- *I would recommend my colleagues have resources to visit the students in person.*
- *It's so fun and inspiring! Meeting with young people is the best.*
- *Just do it!*

- Fully engage and plan with the educator at the site. It makes the whole experience much better.
- Sign-up! :)
- Be yourself. It's a good program

Current positions of role models

- Navigation and Mission Design Engineer
- Aerospace Engineer
- Visiting Assistant Research Scientist
- Physical Scientist
- NASA Postdoctoral Program Fellow
- NASA Program Scientist
- Professor
- Range safety officer/UAS pilot
- Research Scientist
- Goddard Ed and Outreach Lead/SciAct Earthlings Lead

How role models planned their visits

Several role models used more than one method.

Method	#
email	9
call	3
video	3

What role models did with the girls and how it went

Rating	#
1=not very well	0
2=ok	1
3=well	4
4=very well	5
Average	3.4

What they did	1-4	Please explain your rating of how it went
<i>Helped with activities, presentation, answered questions</i>	4	<i>Even after a few hours of activities and getting late, the girls were really engaged and happy to listen while I talked and they had great questions!</i>
<i>A brief intro into what I do and mostly Q&A</i>	4	<i>The girls were very excited and had a lot of great questions</i>
<i>Answered questions</i>	2	<i>Very limited time with the students - they had multiple groups of students rotate out of a room where I was on a Zoom call. They prepared general science questions for me and I answered them very briefly, and the teachers hurried them along so the next group could come in and ask me questions. The interaction was very rushed and somewhat chaotic. Teachers did not prepare the students to ask questions related to my specific expertise. Instead it was any general</i>

		<i>questions about space. I did not substantively interact with anyone - just shot quick answers to quick questions for my entire session. This does not create a memorable experience for students, in my opinion.</i>
<i>Short presentations and Q&A</i>	3	<i>They asked lots of questions about clouds, but none about careers</i>
<i>Presentation, answered questions</i>	3	<i>I received great questions and there were some kids who were clearly very interested. Technical difficulties in the room meant that I couldn't actually see the kids to whom I was speaking, so it felt like the talk was less personal than what I would have liked.</i>
<i>Presentation, and then they did a Mission Patch activity</i>	3	<i>I got a lot of questions which made me happy! A lot of them (not all) seemed nervous around me, so I hope to make them more comfortable in the future.</i>
<i>Presentation and answered questions.</i>	4	<i>Even though the group was small the girls asked very good questions and were engaged.</i>
<i>presentation and answered questions</i>	3	<i>I was virtual and it is always more engaging in person.</i>
<i>Presentation (including short videos), answered questions</i>	4	<i>They were really excited after the presentation and said it was great. Some of those present stated that they hadn't heard of the Artemis missions yet. I was happy that I gave them information about NASA's ongoing efforts. They even asked for information on how to watch the upcoming Artemis 1 launch, which tells me they were genuinely excited.</i>
<i>Talk, Q/A and a quick hands-on activity</i>	4	<i>It was very interactive and there were many questions asked.</i>

Level of engagement and what role models would do differently

Level of engagement	#
1=not engaged	0
2=somewhat engaged	2
3=engaged most of the time	3
4=engaged throughout	5
Average	3.3

What would you do differently?	1-4	Please explain
<i>Nothing explicitly different, I just look forward to getting more comfortable and familiar with doing these types of things.</i>	4	<i>The folks at the Challenger Center did a great job of keeping things moving and having some down time.</i>
<i>Not much, seems to be working</i>	4	<i>Lots of great questions throughout the whole session</i>
<i>I would like the teachers to understand my expertise (astrobiology) better and prepare their students ahead of time to think up thoughtful questions, and I would prefer more substantive / qualitative conversations with students - i.e., maybe one-on-one or in small themed break-out sessions, over multiple days / sessions for each group, etc.</i>	2	<i>It was hard to gauge because the interaction with each group was very rushed and students only got to ask one quick question and then were rushed out of the room to make room for the next group. I think this was not engaging.</i>

<i>Ask them to reflect upon their personal skills</i>	3	<i>Several asked questions. It was a very short interaction. 15 minutes.</i>
<i>If possible, I will visit the students in person. I would also request that the organizer (e.g., teacher) set up a time to do a tech check to make sure everything is working well on both ends.</i>	2	<i>The group I spoke to included both boys and girls. Most of the students who asked questions were boys. Since I could not see the students, it was difficult to assess how engaged the girls in the group were overall.</i>
<i>Maybe chat with them more one on one, and dress more casually. Also, more background info for some topics.</i>	4	<i>I got a ton of questions, which seemed to indicate engagement,</i>
<i>I don't think much needs to change.</i>	4	<i>They clearly listened and paid attention and asked specific questions related to what I talked about.</i>
<i>I'd try to be in person</i>	3	<i>The time of my presentation was before lunch for the girls so they were a little distracted.</i>
<i>I would like to be able to do an in-person event, but barring that, maybe I could create an interactive component that would work well for hybrid format.</i>	3	<i>It is hard to judge without having been in person, which is generally more engaging.</i>
<i>Would like to have been face-to-face or follow up with the group.</i>	4	<i>They asked questions.</i>

IV. Conclusions

What is the nature of the implementation of SciGirls in Space?

Site studies show that a priority was to integrate *SciGirls* activities with existing programs which were often much longer than the *SciGirls in Space* activities required, such as a full summer or semester. The programs were generally successful because they had a reputation for girls (and *SciGirls*) programming. Programs that struggled with recruitment were having issues with recruitment in general and still appreciated the *SciGirls in Space* resources and plan to continue to use them in the future. The site studies can be used with future partners to give them ideas for how to implement the program which is something they identified as valuable to them in their preparation.

What is the effect of the outreach program on girls' awareness and interest in STEM and NASA careers?

Educators reported good effects on youth who attended in their interest in STEM (4.2/5), confidence in doing STEM activities (3.9), collaboration with others (4.1), developing STEM knowledge (4.1), and interest in NASA careers (3.9).

Girls reported learning a lot about space science and that they wanted to know more. They reported statistically significant increases in working together, making a difference, asking questions and exploring, being creative and unique, making mistakes, motivating others, and using STEM to solve community problems. They reported that they got better at these things because they had to work as a team, ask questions, continuing to try, and be willing to make mistakes.

To what extent does SciGirls in Space affect girls' caregivers' support?

All of the families (100%) would recommend *SciGirls in Space* to another family describing it as a wonderful opportunity and learning experience that their child enjoyed every day. Families reported that their girls liked *SciGirls* and many said they would look for more opportunities like this.

What is the effect on role models?

Role models report that working with the youth was very rewarding and even fun, especially if you can go in person. They would encourage others to be role models and to be themselves. They found it inspiring to work with the young people. They loved having questions and hearing the students' thinking.

What is the reach of SciGirls in Space resources?

Programs funded through this grant at 15 sites reached 369 girls, 299 family members, and involved 43 role models in a total of 62 sessions and 96 hours of programming.

Appendices

Appendix A: Partner Site Studies

Basic Enhancements Inc. https://www.becdi.org	
Type of program	School-based, afterschool program, Girl Scouts, Engineering (1 visit), Middle school
Where was the program held?	School, community center
Facilitator background	<i>Science teacher at middle school</i>
How many SG in Space sessions did you have? How long were they?	Girl Scouts comparing oil on Earth and the moon (3 sessions) , at school every Wed did something with the girls (10 sessions), New Black Wall Street (5 sessions microgravity)
Month and year	June and October
Number of youth who participated in the SciGirls in Space program	Girl Scouts (10-15 elem and middle); Engineering (10-15, some Girl Scouts – did coding videos, mentor videos); Middle school (exploring my place in the universe, moon mud, gravitational pull on the Earth); Extended Learning Time (after school, 10 girls – sent paper surveys)
Community Type	Urban, Suburban
Grade levels of youth participants.	Middle school (6-8)
How many family members were involved? In what ways?	10 – <i>Many parents attended community events that we presented for SciGirls</i>

Which SciGirls in Space resources did you use? Check all that apply.

- Insulator Innovator
- Star Power with episode
- Role model is from the Skype A Scientist Program (microbiologist a postdoc researcher at Jones Lab (U of FL), Dept. of Microbiology & Cell Science.
- Role model: Dr. Olivia Wilkins of Goddard, has been connected with Basic Enhancements as of 9/14/22 through SciGirls talked about engineering design processes, her route, funding. All my classes saw her, even the boys, 130 kids in four classes. Two other teachers logged in.
- Role Model Video: Space Station Explorers (girls who flew their experiments on the ISS)
- Role model: Chanel Mosby-Haundrup is from the Skype A Scientist Program (a postdoc researcher at Jones Lab (U of FL), Dept. of Microbiology & Cell Science. 2nd RM, Dr. Olivia Wilkins of Goddard, has been connected with Basic Enhancements as of 9/14/22.



If other, please describe:

Due to space and time, I integrated activities with class standards

What challenges did you face in implementing the SciGirls programs?

Recruiting girls to attend/stay, time constraints, facility, other

If you faced any challenges, please describe them

Had trouble over the summer. Used to doing SciGirls over the summer. Been with SciGirls since 2017. Most of the time I would do it in the summer, but this year kids didn't sign up, so I did it with kids who were already here at my school and in the clubs.

Rate the effects that you observed on the youth in your program. 1-5=great effect

Area	Rating
Interest in STEM	4
Confidence in doing STEM activities	4
Collaboration with others	4
Developing STEM knowledge	4
Interest in NASA careers	3

Would you recommend *SciGirls in Space* to another educator? Yes

What would you say?

I would say that it's a great resource and addition to existing learning opportunities at school.

Other comments or reflections

Boys don't care that women are the role models. The boys were asking to participate. I did code.org with the boys, and some Minecraft things. One role model on video was transgender and that was great for some of our students, just keep the path and find mentors to guide you.

I had them start digital portfolios with the things they did and created in a google slide show so their STEM identity. I started a lab room in TikTok that was inspired by this project. One student who an artist do a huge drawing of the Hubble. Her eyes lit up when she heard one of the role models said she was an artist.

I'm doing more hands-on because of the literacy level of students. I know how to teach students how to read because I came from elementary school.

With the Girl Scouts, I had stations, soil profiles. A couple of girls said, "Did she bring dirt in here? I don't even go outside." When they got into their soil samples and they analyzed it, they were SO excited. They found roots, bugs, and One of the parents said, I don't know what they did but we are finding holes in the yard.

My STEM program, Discover Your World, I can tell them that anything they are into, I can tell them about the science behind it. I ask them what they are into. One girl said she was in fashion and design. I can tell you how fashion and science go together. She was amazed. The next year, we partnered with a fashion designed. The kids have to inspire us with what they are interested in.

In 6th grade we teach heliocentric model vs. geocentric model. Helium balloons at a party, put them in my truck, leave the windows open a little, why are the balloons trying to get out. Where are they trying to go? That's when I learned there is helium in the air we breathe and on the Sun. The balloons are trying to go back home to the Sun.

The Challenger Center of Maine <https://www.astronaut.org>

Type of program	Evening, Friday night
Where was the program held?	Museum/science center
Facilitator background	Informal educator who has worked with preschool, science center, and Audubon
How many SG in Space sessions did you have? How long were they?	1 program - 3.5 hours long
Month and year	September 22
Number of youth who participated in the SciGirls in Space program	39, great response, families joined for role model speaker and telescope viewing
Community Type	Urban, but within a rural area
Grade levels of youth participants.	5 th through 8 th , recruited through social media, homeschool groups, schools
How many family members were involved? In what ways?	<i>So many! Didn't get a chance to count! At least 1-3 per student. They watched a Role Model video, heard our NASA role model speak, and participated in a star gazing activity.</i>

Which SciGirls in Space resources did you use? Check all that apply.

- Role Model Video: NASA Intern, Kirsi, used this to set the stage
- Insulator Innovator showed part in lab| Escuadrón Espacial (Space Squad) Episode
- Star Power | Star Power Episode
- Role Model Video: NASA Engineer, Alma Stephanie Tapia
- Role Model visited in person from Goddard: Laureen Konitzer (Schlenker)

If other, please describe:

Everyone was so helpful from SciGirls. They kept following up to get us a speaker and materials.

What challenges did you face in implementing the SciGirls programs?

Time constraints

If you faced any challenges, please describe them

- So much great content, could have gone all night

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

Area	Rating
Interest in STEM	4
Confidence in doing STEM activities	4
Collaboration with others	4
Developing STEM knowledge	4
Interest in NASA careers	3

Would you recommend *SciGirls in Space* to another educator? Yes

What would you say?

It was great! Materials are cheap, lessons are flexible, students were engaged. We had a wonderful response. We've had in-person events before that weren't so successful with middle school. With elementary, the parents sign them up. We had many more sign up. We think there's interest in girl programming. Also interest in space seemed to be a factor. Hands-on activities were also a draw. Hadn't confirmed role model until halfway through the sign up process. Some of the girls said, I love this show (SciGirls).

Other comments or reflections.

Part of our NASA Community Anchor program is reaching out to rural schools, mainly sending them things, since they can't come down to Bangor. Also have 2 girl events planned – doing a virtual mission with a role model. Plan to use the Insulator activity. Working together with Portland Children's Museum.

Challenger Learning Center of Northern Nevada
<https://www.mightycause.com/organization/Challengerlearningcenterofnorthernnevada>

Type of program	Weekend program: We conducted a three-hour Workshop where girls and parents did hands-on SciGirls activities, viewed a Planetarium dome (native astronomy) show as well as a SciGirls episode, met a NASA role model in person, and used an iPad app to design and test drive a rover on Mars.
Where was the program held?	Fleischmann Planetarium and Science Center at the University of Nevada, Reno
Facilitator background	English major, history minor, middle school; husband as HS English teacher who did interdisciplinary unit on space, went to Challenger Center in Sacramento. They worked for 12 years to get a Challenger Center in Reno. Took a portable planetarium out to the schools. It closed due to covid and other changes. Now are at Fleischman Planetarium and doing programs from there. Fleischman is working with tribal leaders on native astronomy.
How many SG in Space sessions? How long were they?	We conducted a three-hour Workshop where girls and parents did hands-on SciGirls activities, viewed a Planetarium dome show as well as a SciGirls episode, met a NASA role model in person, and used an iPad app to design and test drive a rover on Mars.
Month and year	October 2022

Number of youth who participated in the SciGirls in Space program	7, we wanted tribal girls so recruited through the college and tribal leaders
Community Type	Mixed - some live on colony land in town, others came from rural areas, reservations.
Grade levels of youth participants.	Upper elementary (4-5)
How many family members were involved? In what ways?	6 adults brought their kids, and participated fully with the girls

Which SciGirls in Space resources did you use? Check all that apply.

- Dakota Stars
- Imagination Station
- Role Models Ayanna and Marianne
- NASA role model

If other, please describe:

Planetarium show

What challenges did you face in implementing the SciGirls programs?

Recruiting girls to attend/stay

If you faced any challenges, please describe them

We were targeting tribal girls and families as we selected the Dakota Stars episode to screen. We sent emails out to different tribal groups and educators, but many did not start to respond until we got closer to the event. I re-sent emails to those I hadn't heard from, but as it was a targeted audience I could not just post an all-call on social media.

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

Area	Rating
Interest in STEM	4
Confidence in doing STEM activities	4
Collaboration with others	4
Developing STEM knowledge	4
Interest in NASA careers	4

Would you recommend SciGirls in Space to another educator? Yes

What would you say?

SciGirls offers a great range of video and hands-on activity resources to encourage girls to strengthen their view of themselves as being capable of being successful scientists.

Other comments or reflections

In addition to our NASA mentor, we also included one of her grad students in our presentation, and we had three female college student interns who helped with activities. The Dakota Stars was so special and it had the art in there too.

Wendy Calvin, role model, girls were asking such an in-depth questions about her work on Mars Mission. Had instruments on a satellite orbiting Mars. Involved with Perseverance and Opportunity, and involved in the planning of other missions. She didn't have a straight line into her position so the girls were fascinated with that.

Exploration Works <https://www.explorationworks.org>

Type of program	Summer program – Summer Camp
Where was the program held?	Exploration Works is Children’s Museum/Science Center in Helena MT – we run camps all summer – had 700 in 2022
Facilitator background	<i>Was trained seven years ago in SciGirls; informal educator</i>
How many SG in Space sessions did you have with the girls? How long were they?	One session within a four-day summer camp. The session was 1 hour. Go to labs at local
Month and year	August 2022
Number of youth who participated in the SciGirls in Space program	6
Community Type	Urban
Grade levels of youth participants.	Upper elementary (4-5), Middle school (6-8)
How many family members were involved? In what ways?	Not involved

Which SciGirls in Space resources did you use? Check all that apply.

Insulation Station: create a container for an ice cube – had an engineer come in. Showed the clip SciGirls Star Power, made Constellation boxes

If other, please describe:

Had several role models in person: Cardiologist who dissected a sheep heart, optics professor, engineer, physician, NASA

Monday	Tuesday	Wednesday	Thursday
1:30 Breakout Box (Zombie virus)	1:30 – Dr. Holper Heart dissection	1:30 – Carroll College – Mary Keefe and optics (Engineer/physicist role model)	1:30 – Finish archaeology digs 2:00 – Start constellation boxes *SciGirls Star Power*

3:30 - Discuss future goals, career paths	3:30 – Cheryn Metzger, engineer role model *SciGirls Insulation Station*	2:30 – Xenoarchaeology excavation, assemble artifacts into ancient civilization	3:00 – Dr. Plate, physician role model
4:00 - Choice: dissect cow eye OR try robot kits	4:30 – Talk about NASA guest	4:00 – NASA guest, Emily Judd	4:00 Finish constellation boxes

What challenges did you face in implementing the SciGirls programs?

Recruiting girls to attend/stay. Other SciGirls sites in Montana also have a hard time getting girls. Stopped offering afterschool SciGirls.

If you faced any challenges, please describe them

Recruitment is a huge struggle for SciGirls. The girls who come love it, but don't seem to sign up like students in our other camps. In the past we have gone to visit schools and talked to specific grade levels, which might attract 1 or 2 girls. We haven't had luck with other strategies. We are planning to be more aggressive before school ends in May next year to get more girls..

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

They came in really gung ho and left high. The camp reinforced their interest. One of the questions from the student who was interested in engineering of our role model was what she should do to prepare, like courses, experiences, and content. She came in very motivated.

Area	Rating
Interest in STEM	2
Confidence in doing STEM activities	2
Collaboration with others	2
Developing STEM knowledge	3
Interest in NASA careers	4

Would you recommend SciGirls in Space to another educator? Yes

What would you say?

It's worth the effort. I've done it for seven years. We use the activities in other camps. The activities really work, for both boys and girls. I'm a SciGirls trainer too and in the trainings I've done people really seem to like it.

Other comments or reflections

I wanted them to get a taste of project-based learning – not super deep since we only had four hours a day Another activity was excavating buckets of dirt, rocks, plastic, then characterize the alien civilization. Because there were only six, I asked them what they wanted to do, so I changed up the schedule because one girl wants to be an engineer. We teach them about anatomy through dissections and a cardiologist do a dissection of a sheep heart. One girl who was squeamish said afterwards it was awesome. One girl has been to SciGirls three years in a

row. Three girls were new. I was impressed with how quickly a role model got set up for us when one of the girls said she wanted to be an engineer. It was very easy and role model was great.

Girls Inc. TN Valley <https://www.girlsinctnv.org/>

Type of program	Afterschool program, Summer program
Where was the program held?	During an all-day summer camp, girls attend daily for 8 weeks. Girls Inc. facility
Facilitator Background	Education specialists (2); VP for Programs & Operations oversaw the program
How many SG in Space sessions did you have with the girls? How long were they?	8 weeks; 9-4 pm camp – did other activities; had a theme of the week
Month and year	June & July 2022
Number of youth who participated in the SciGirls in Space program	20 attended consistently
Community Type	Suburban
Grade levels of youth participants.	Upper elementary (4-5), Middle school (6-8)
How many family members were involved? In what ways?	Parents were informed of activities at the end of camp

Which *SciGirls in Space* resources did you use? Check all that apply.

- Cloud Clues Activity | SkyGirls Episode
- Star Power | Star Power Episode
- Phototropism: Do Plants Prefer the Blues?
- Role Model Video: Space Station Explorers (girls who flew their experiments on the ISS),
- Other role models from FabFems.org (2)

What challenges did you face in implementing the *SciGirls* programs? None

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

Area	Rating
Interest in STEM	5
Confidence in doing STEM activities	4
Collaboration with others	5
Developing STEM knowledge	4
Interest in NASA careers	5

Would you recommend *SciGirls in Space* to another educator? Yes

What would you say?

At Girls Inc. we provide STEM opportunities to girls outside the box and meet the girls where they are (our center) to expose them to these opportunities. Sci Girls has a show that is easy to

access anywhere and the girls can also watch other episodes on their own. SciGirls provides resources that are easy to follow, interesting, as well as diagrams and pictures that are pleasing; and attracts girls to get their attention.

Other comments or reflections

Our girls who participated this summer in programming really enjoyed this; so much that we are continuing with this group during our fall programming in outreach in the schools (N=60). We are also planning to take a few of the most interested girls from this summer to the space museum in Birmingham AL. We are hoping to stay on site and working to have the entire trip sponsored.

The National High Magnetic Field Lab (FL) in collaboration with Florida State University School <https://www.fsus.school>

Type of program	Afterschool program in collaboration with MagLab and Carlos Diaz
Where was the program held?	At the school
Facilitator background	Has taught middle and high school Earth science and physics and summer courses at eh Maglab
How many SG in Space sessions? How long were they?	6 sessions, 1 hour each, over six weeks
Month and year	Sept-Oct 2022
Number of youth who participated	34, mostly 5 th and 6 th graders and two boys
Community Type	Urban
Grade levels of youth participants.	5-8
How many family members were involved? In what ways?	Had family meetup at the end.

Which *SciGirls in Space* resources did you use? Check all that apply.

- Cloud Clues Activity | SkyGirls Episode
- SciGirls Dangers of Space Travel Episode
- *Jessica Taylor from Langley was our SG role model and she talked about cloud observer program that she worked. She sent us the observing card and we have data we collected to send her for her citizen science project. We connected that with the Cloud Clues activity.*

If other, please describe:

We had two other role models. Kim Sharkie is the mom of one our HS students. I had taught her daughter on zoom school in 2020 when the Perseverance landed. She works for Florida emergency management so had to be at launch. Janice Houston, from Harvard, helped build telescopes, like the Event Horizon telescope that will look for black holes. We got her through the MagLab.

What challenges did you face in implementing the *SciGirls* programs?

Time constraints

If you faced any challenges, please describe them

We had so much planned and not enough time to do it all. Bringing in mentors was awesome, but then we ran out of time for the paired activity. We just tried to do our best and be flexible. We sometimes sent girls home with unfinished projects. I'd like to have 90 minutes per session so we can do an activity and meet with a role model.

Rate the effects that you observed on the youth in your program. 1=no effect, 5=great effect

Area	Rating
Interest in STEM	4
Confidence in doing STEM activities	4
Collaboration with others	4
Developing STEM knowledge	3
Interest in NASA careers	4

Would you recommend *SciGirls in Space* to another educator? Yes.

What would you say?

This program is so wonderful at targeting girls and girls of color to keep up interest in STEM fields. I love doing SciGirls programs! I've used a lot of the SG activities in the other things.

Other comments or reflections.

We did not have problems with recruitment since I do other clubs and the teachers got behind it. We heavily recruit for all our summer camps. I recruited five girls from our STEM Honors society and made them mini mentors. They were great!

North Dakota Space Grant Consortium <https://ndspacegrant.und.edu>

Type of program	Summer program
Where was the program held?	School – University setting Aerospace School UND
Facilitator background	Taiwan ESL educator afterschool program for 6 year; came back, studying science Master degrees, Bachelor’s communications
How many SG in Space sessions did you have with the girls? How long were they?	4 three hour sessions; 9-1 pm every day; tours
Month and year	June 21-24 2022
Number of youth who participated in the SciGirls in Space program	16; recruited through listservs of educators, university system, online ad, social media, UND community day winter (N=400); grades 6-8
Community Type	Urban, rural
Grade levels of youth participants.	Upper elementary (4-5), Middle school (6-8)
How many family members were involved? In what ways?	Approximately 32. <i>Family members attended our Friday gathering. We had an awards ceremony and hosted a rover race competition.</i>

Which *SciGirls in Space* resources did you use? Check all that apply.

Cloud Clues Activity | SkyGirls Episode

Grab and Go Activity | Deep Sea Diver Activity | Aquabots Episode (huge hit with the girls)

If other, please describe:

- Role model Jenn Fowler from NASA Langley
- STEM ambassadors—came to talk about being a pilot; another person working on rockets spoke to girls about their career paths

What challenges did you face in implementing the *SciGirls* programs?

Time constraints; a few more videos would have been good to use. Would do more time on Cloud clues journal; spent a lot of time with role models which the girls really enjoyed. Did a rover experiment so more time on coding. We plan to invite these girls to our SG camp next summer. Melissa and Caitlin did SG training and ran programs in prior years. The new education specialist took the training this year and went over handbook with ambassadors.

If you faced any challenges, please describe them.

We were hoping to have two more students but they were no-shows.

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

Area	Rating
Interest in STEM	5
Confidence in doing STEM activities	5
Collaboration with others	5
Developing STEM knowledge	5
Interest in NASA careers	4

Would you recommend *SciGirls in Space* to another educator? Yes

What would you say?

SciGirls has great educator resources and promotes diversity.

Other comments or reflections.

One student had to leave early one day, but I told my mom I don't want to because this is the best summer camp I have ever been to. Her mom said that her other children were jealous. Students didn't report any issues or needs: "it was perfect the way it was." Failure in science are the norm. We talked about NASA's missions. I learned it's okay to fail. That it will probably happen in science. Seeing Jenn in a NASA position was really important to them. Many said they enjoyed collaboration and learned to work together.

Pisgah Astronomical Research Institute (PARI) with Rosman Middle School, Brevard NC

Type of program	Afterschool every day for a week
Where was the program held?	School
Facilitator background	8 th grade science teacher at Rosman Middle School; PARI sent a facilitator to help
How many SG in Space sessions did you have? How long were they?	5 sessions, 2 hours each day so parents could pick them up after work
Month and year	Sept 2022
Number of youth who participated	8
Community Type	Rural
Grade levels of youth participants.	5 th -8 th (1 5 th grader, 3 6 th , 2 7 th , 2 8 th)
How many family members were involved? In what ways?	<i>Families were invited the last day of the program to see what the girls had been working on for the week and time to complete the parent survey. We only had 2 families come to this time.</i>

Which *SciGirls in Space* resources did you use? Check all that apply.

Did a lesson a day, hands-on started then they took it with them. Watched a video, talked through the lesson, then they worked.

- Insulator Innovator | Escuadrón Espacial (Space Squad) Episode
- Star Power | Star Power Episode, Role Model Video
- Space Station Explorers (girls who flew their experiments on the ISS), Astronaut biography – Christina Koch – on the video

What challenges did you face in implementing the *SciGirls* programs?

Recruiting girls to attend/stay, Time constraints

If you faced any challenges, please describe them

We had a difficult time recruiting girls to attend and stay afterschool. We live in a rural low socio-economic community and with a lack of school/program provided transportation it limited which girls had the ability to stay due to having to ride a school bus. We also had a scheduling conflict come up, where the middle school volleyball team (which had several girls interested in the program) practice times changed which meant they were not able to participate. We also wished we could do more but time seemed limited, with us only having it one week.

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

Area	Rating
Interest in STEM	4
Confidence in doing STEM activities	4
Collaboration with others	4

Developing STEM knowledge	4
Interest in NASA careers	3

Would you recommend *SciGirls in Space* to another educator? Yes

What would you say?

I would recommend the program. It has great content and resources to engage girls in STEM. The hands-on activities were enjoyed by our students and they encouraged girls to work together and encourage one another. The connections to the real women in STEM careers and NASA scientists were very beneficial in helping girls make connections to future careers for themselves. It would have been beneficial to have been provided with some resources for recruiting and advertising the program. But overall, it went really well.

Project Scientist <https://projectscientist.org>

Type of program	Three local libraries did SG (Independence, Sugarcreek, Allegra), only one did parent night (Sugarcreek) Afterschool program, Evening program
Where was the program held?	Public Libraries: girls are together, the PS facilitator is virtual with local library staff helping. One staff member is in the area (worked with Sugar Creek)
Facilitator background	<i>Most are credentialed teachers</i>
How many SG in Space sessions did you have with the girls? How long were they?	Same program at all three sites, a hybrid after-school program where girls from the Charlotte area convene at a local library and engage in hands-on STEM activities with a virtual teacher from Project Scientist. 4 sessions; 90 minute sessions
Month and year	October/November 2022
Number of youth who participated in the SciGirls in Space program	Grades 4-8; 35 from all three libraries; 150 in STEM Club in addition to libraries (data collected only at libraries)
Community Type	Mixed urban, suburban, rural
Grade levels of youth participants.	Upper elementary (3-8)
How many family members were involved? In what ways?	Nine students with family members of one library branch attended a family STEM night (Nov 9) to engage with a space role model virtually, look at what their students had completed throughout the month, and engage in star gazing with a local astronomy club.

Which *SciGirls in Space* resources did you use? Check all that apply.

- Cloud Clues Activity, SkyGirls Episode
- Imagination station
- Mission patch party
- FabFems videos

If other, please describe:

Role Model Videos: Aarthi and Janelle

We had all students (Approx. 150 students) in STEM Club participate in the activities but kept track of those at our three library locations (35 students)

Dr. Valencia came last week, a lunar geologist from Goddard. Sarah McCandless from JPL who we've worked with before spoke at parents' night.

What challenges did you face in implementing the SciGirls programs?

Time constraints

If you faced any challenges, please describe them

A restraint was we are not able to finish all that is planned, but it does not seem to hinder the actual programming that is put out to the kids. The flu was going around the last week so they didn't get to do the last week. Managing the classroom while following along with the virtual lessons and communicating between the kids and the teacher on screen is challenging for one person, but we are not able to spare another staff member to help.

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

Area	Rating
Interest in STEM	4
Confidence in doing STEM activities	4
Collaboration with others	4
Developing STEM knowledge	4
Interest in NASA careers	4

Would you recommend SciGirls in Space to another educator? Yes

What would you say?

SciGirls in Space has many interactive projects and will get kids excited about space! It is a fabulous program to engage young people in STEM activities and help them make connections to the greater world as well as their local communities.

Other comments or reflections

Nov 10, 2022 We completed the program last night and it was so successful! We had a wonderful four weeks and the parent celebration was a lot of fun! The parents enjoyed seeing their students' work and engaged with a NASA JPL scientist virtually.

It was my first time teaching SciGirls. I took the SciGirls training - black SG and connect. I really liked the art activities. They were fun and creative. We do an engineering design challenge with a box of materials - go create. The kids had so many different ideas for Imagination Station. The students related to Jenelle as an African American. It's easy to use them too because they are short.

Thank you so much to the funders and teachers of Project Scientist!! I know our participants here in Charlotte will miss the social interactions with each other, as well as with the teacher Ms. Jacki, both virtually and in-person! It may also be fun to have a 'big teach' meetup of all the local kids for a fun competition with the various STEM activities, or something that is team building so the kids can meet other STEM Club participants. Just a thought. Thanks again!!

Town of Ramapo Challenger Center <http://www.ramapoparks.org/page/challenger-learning-center-3.html>

Type of program	Afterschool program
Where was the program held?	Museum/science center
Facilitator background	<i>Started running summer camps in 2001, 2002. Had worked at AT&T. Now Director now, History undergrad, CS major, education degrees</i> <i>Irina did most of the teaching. Did SciGirls code in a yearlong program.</i>
How many SG in Space sessions did you have with the girls? How long were they?	4 sessions - 2+ hours each
Month and year	5/31/22 - 6/21/22
Number of youth who	7 from local schools in Rockland County
Community Type	Suburban
Grade levels of youth participants.	Grade 4-7
How many family members were involved? In what ways?	<i>Each girl brought family to the outreach session – a Joint mission to Mars was enjoyed by all. After the mission the girls presented their projects and watched a ppt presentation with many photographs that were taken during the entire SciGirls in Space program.</i>

Which *SciGirls in Space* resources did you use? Check all that apply.

- Cloud Clues Activity | SkyGirls Episode
- Star Power | Star Power Episode
- Role Model Video: Space Station Explorers (girls who flew their experiments on the ISS)
- Other role models from FabFems.org
- Astronaut biography – Christina Koch, had a downlink with her at our center. Some of the girls were in that. She was the astronaut who was up there for year – longest ISS women.
- Did Challenger mission on last day with parents and siblings – 6 students

If other, please describe:

Role model videos with traffic and bike engineers

What challenges did you face in implementing the *SciGirls* programs?

Since we ran an after-school program at the end of the school year we had very little time to recruit middle school girls for the program.

If you faced any challenges, please describe them

Due to limited advertisement affects. Difficulty to get 20 girls in short period of time. Mixed up the girls for each activity. They got along well.

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

Area	Rating
Interest in STEM	5
Confidence in doing STEM activities	4
Collaboration with others	4
Developing STEM knowledge	5
Interest in NASA careers	3

Would you recommend *SciGirls in Space* to another educator? Yes

What would you say?

It is a great way to introduce STEM to girls via fun projects. Girls loved activities. The program has many engaging activities and videos. The activities foster collaborative learning, and empower the girls to think critically as they continually re-design and re-test their projects.

Other comments or reflections.

Number of parents were unhappy about the gender sections in the girls' questionnaire. I think it should be printed on a separate page to be given to the girls at parent's discretion. I enjoyed working with the girl's and watching them explore through fun and forming friendships.

Reading Public Museum and Planetarium, <https://www.readingpublicmuseum.org>

Type of program	Overnight (do 4/year); workshop, stations; 6:30-10:30
Where was the program held?	Museum
Facilitator background	5 educators; main-undergrad Music perf; certified in music, LA, theatre; all educators
How many SG in Space sessions? How long were they?	4 hours
Month and year	Nov, 2022
Number of youth who participated in the SciGirls in Space program	70, 30 adults
Community Type	Girl Scouts of eastern PA, heart of PA
Grade levels of youth participants.	Mixed
How many family members were involved? In what ways?	30, did the whole experience

11.11-12.22 GSEP Da Vinci Engineerium Overnight

Scout Schedule - MASTER

	Blue Group	Yellow Group	Orange Group	Pink Group
6:00-6:30	Check In, Campsite Set up, Free time in museum	Check In, Campsite Set up, Free time in museum	Check In, Campsite Set up, Free time in museum	Check In, Campsite Set up, Free time in museum
6:30-6:45	Welcome and Introduction Museum Auditorium	Welcome and Introduction Museum Auditorium	Welcome and Introduction Museum Auditorium	Welcome and Introduction Museum Auditorium
6:45-7:15	Guest Speaker from NASA - SciGirls in Space Role Model: Dr. Kelsey Prissel Museum Auditorium	Guest Speaker from NASA - SciGirls in Space Role Model: Dr. Kelsey Prissel Museum Auditorium	Guest Speaker from NASA - SciGirls in Space Role Model: Dr. Kelsey Prissel Museum Auditorium	Guest Speaker from NASA - SciGirls in Space Role Model: Dr. Kelsey Prissel Museum Auditorium
7:15-8:00	Insulator Innovator Challenge Atrium	Evening Snack & SciGirls Viewing Museum Auditorium	Star Power Meinig Gallery	Da Vinci Bridge Challenge Founders Gallery
8:00-8:45	Evening Snack & SciGirls Viewing Museum Auditorium	Insulator Innovator Challenge Atrium	Da Vinci Bridge Challenge Founders Gallery	Star Power Meinig Gallery
8:45-9:30	Star Power Meinig Gallery	Da Vinci Bridge Challenge Founders Gallery	Evening Snack & SciGirls Viewing Museum Auditorium	Insulator Innovator Challenge Atrium
9:30-10:15	Da Vinci Bridge Challenge Founders Gallery	Star Power Meinig Gallery	Insulator Innovator Challenge Atrium	Evening Snack & SciGirls Viewing Museum Auditorium
10:15-10:45	Free time & Get ready for bed	Free time & Get ready for bed	Free time & Get ready for bed	Free time & Get ready for bed
10:45-11:00	LIGHTS OUT	LIGHTS OUT	LIGHTS OUT	LIGHTS OUT
6:00	LIGHTS ON	LIGHTS ON	LIGHTS ON	LIGHTS ON
7:00-7:55	Breakfast in Atrium or Museum Auditorium, Clean up, and free time	Breakfast in Atrium or Museum Auditorium, Clean up, and free time	Breakfast in Atrium or Museum Auditorium, Clean up, and free time	Breakfast in Atrium or Museum Auditorium, Clean up, and free time
8:00	Sleepover Ends all participants must exit the building	Sleepover Ends all participants must exit the building	Sleepover Ends all participants must exit the building	Sleepover Ends all participants must exit the building

Which *SciGirls in Space* resources did you use? Check all that apply.

- Insulator Innovator
- Star Power and video
- Dr. Kreisel, NASA role model

If other, please describe:

DaVinci exhibit – models of his inventions and art

What challenges did you face in implementing the *SciGirls* programs?

Staff changes and timing.

If you faced any challenges, please describe them

Needed an extension

Rate the effects that you observed on the youth in your program. 1=no effect, 5=great effect

Area	Rating
Interest in STEM	5
Confidence in doing STEM activities	3
Collaboration with others	5
Developing STEM knowledge	4
Interest in NASA careers	3

Would you recommend *SciGirls in Space* to another educator? Yes

What would you say? *The lesson plans are excellent, well thought out, thought-provoking for the girls, and applicable to practical things. I like that there are plans and videos. We just need to keep going with girls in STEM.*

Other comments or reflections.

I've used SciGirls activities in the past. We set up everything as a challenge. We saw a huge variation in the groups (troops), in how they approached the problem. Some had clearly had more experience with challenges, and some had more drive. One of the girls asked the role model, "If I want to do something like you do, where do I stuff here I can do?"

Science Center of Iowa <https://www.sciowa.org>

Type of program	Summer program - <i>We did a full space camp and we also used SciGirls in Space activities for a separate camp (1 week each) Do 10 weeks of camps during the summer.</i>
Facilitator background	<i>Camps manager now, was an instructor of GED classes at a college (vocational ed)</i>
Where was the program held?	Museum/science center
How many SG in Space sessions did you have with the girls? How long were they?	<i>For our space camp we had a full week, but we facilitated a makeup day for some girls who missed a day due to transportation from a community center. SciGirls Create, our second camp, had a full week. 9-4 each day. Whenever the camp had a break, we put on a SciGirls episode.</i>
Month and year	July 2022, August 2022
Number of youth in program	30 in space camp (including 10 girls from another program who came with a staff member); in SciGirls had 19
Community Type	Suburban
Grade levels of youth participants.	Middle school (6-8)
How many family members were involved? In what ways?	<i>On the last day of camp girls had a short presentation of what they participated in over the summer. We also had them take a role model bio sheet home and share with guardians about their interactive meet and greet with her.</i>

Which SciGirls in Space resources did you use? Check all that apply.

- Insulator Innovator | Escuadrón Espacial (Space Squad) Episode
- Cloud Clues Activity | SkyGirls Episode
- Star Power | Star Power Episode
- Other SciGirls videos
- Role Model Video: Space Station Explorers (girls who flew their experiments on the ISS)
- Astronaut biography – Jessica U. Meir

What challenges did you face in implementing the SciGirls programs?

Managing participant/coordination/managing staff, Our greatest challenges were ratios as far as staffing in the first camp. We also experienced a lot of resistance to space from the girls.

If you faced any challenges, please describe them

We had big challenges with staffing at this point in the summer. It was very challenging for our educators to facilitate quality STEM experiences when there were a lot of big behavior challenges in the room. We encountered a lot of resistance among campers who were signed up by their parents without knowing what the camp would be about. We struggled to find a balance between play and STEM content. I feel that we overcame this by providing more support, breaking campers into smaller groups, and simplifying the lessons to one concept we hoped campers would walk away with. In our second camp, we faced very little resistance and things went very smoothly.

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

Area	Rating
Interest in STEM	3
Confidence in doing STEM activities	3
Collaboration with others	4
Developing STEM knowledge	4
Interest in NASA careers	3

Would you recommend *SciGirls in Space* to another educator? Yes

What would you say?

They have great activities and video content. We did other SciGirls videos and activities that were not specifically space related. This was my first summer at the science center. They have always done a girls camp in that age group (4-6th grade). I used SciGirls as curriculum for other camps throughout the summer because it's good, tested, and understandable for counselors (not all have taught). Finding lesson plans that are replicable with very little time for planning. We have supplies specifically for the camps. We write the curriculum, identify the activities, and order the supplies.

Other comments or reflections.

I would love to see more activities to choose from in the future. We're always looking for as much content as we can get. I would love to see more activities about space that youth can do in 30-45 minute. Having the activities in one place would also be helpful.

Scobee Education Center <https://www.alamo.edu/sac/scobee>

Type of program	Summer program – Artemis Girls Program
Where was the program held?	San Antonio College
Facilitator Background	Associate Director of Instruction; former HS science teacher in region, also taught middle school 2 years
How many SG in Space sessions did you have? How long were they?	6 sessions for a total of 4.5 hours over 5 days; held as part of the Artemis Academy for Girls summer camp
Month and year	July 25-29 2022

Number of youth who participated	18 girls; 16 completed
Community Type	Urban
Grade levels of youth participants.	Middle school (6-8)
How many family members were involved? In what ways?	<i>We had family members engage during drop off and pick up.</i>

Which *SciGirls in Space* resources did you use? Check all that apply.

- Workin’ It Out
- Science Cooks!
- Role models from FabFems.org
- Rocket Scientist Karolyn Young (Astra Femina)
- Astronaut Eileen Collins in person

What challenges did you face in implementing the *SciGirls* programs?

Recruiting girls to attend/stay, time constraints, covid

If you faced any challenges, please describe them

Some girls who signed up were exposed to the new COVID-19 strain and had to withdraw. We have been working with this cohort of girls since March, so there were some relationships in place; however, during camp two girls could not attend due to COVID-19 exposures. The parents indicated they intend to keep the girls connected to Scobee in the future.

Rate the effects that you observed on the youth in your program. 1=no effect, 5=great effect

Area	Rating
Interest in STEM	5
Confidence in doing STEM activities	5
Collaboration with others	5
Developing STEM knowledge	5
Interest in NASA careers	5

Would you recommend *SciGirls in Space* to another educator? Yes

What would you say?

SciGirls offers resources that will 'kick-start' an all-girl STEAM program if you have not previously established one. Its resources are exceptionally well-designed and keep the values of any effective program in focus. Since we have had an all-girl program in place for multiple years, the *SciGirls* resources were complementary to what we had designed before the grant became available. We appreciated the quality of a ready to launch set of resources that easily fit into our existing program.

Other comments or reflections.

The girls loved Science Cooks and calculating their nutrition facts. When they saw how you break it down, they were very exact. When parents dropped them off, they said that the girls were telling them all about what they learned. The video gave really good background.

In Working it out, the girls collaborated and talked about sports they like to do. They enjoyed debating about their favorite workouts: *I think swimming is a better work out because it is easier on your joints and full body.* Then they wrote out their workout plan.

University of Montana spectrUM Discovery Center <https://www.umt.edu/spectrum/>

Type of program	Summer program
Where was the program held?	Missoula Public Library spectrUM center is there
Facilitator background	Elementary educator, director since 2008, co-directs MT Girls Collaborative Jesse Herbert-Meny Exec Dir Teacher Undergrad Student – Sam Massey, Alyssa Giffin, camps coordinator did interview
How many SG in Space sessions did you have? How long were they?	3 - 90 minute sessions in weeklong camp for girls
Month and year	July 2022
Number of youth who participated in the SciGirls in Space program	14
Community Type	Suburban
Grade levels of youth participants.	Upper elementary (4-5), 2nd-3rd graders also
How many family members were involved? In what ways?	None, other than pick up and drop off

Which SciGirls in Space resources did you use? Check all that apply.

- Cloud Clues Activity and SkyGirls Episode
- Star Power and Star Power Episode
- Keep Out SciGirls Activity

If other, please describe:

Role Model: Jenn Fowler, NASA employee, talked about weather balloons

Dates:	July 25th	July 26	July 27	July 28	July 29
	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 - 9:15	Free Play	Free Play	Free Play	Free Play	Free Play
9:15-9:45	Introductions, Camp Agreement, Ice Breakers	Check-In, Ice Breakers	Check-In, Cloud Clues	Check-In, Ice Breakers	Check-In, Ice Breakers
9:45 - 10:30	Intro to Tech, PB&J	Introduce EV3 Robots		Intro to Scratch	Circuit Building
10:30 - 11:00	Break at Kiwanis	Break at Kiwanis	Break at Kiwanis	Break at Kiwanis	Break at Kiwanis
11:00 - 12:00	Cubelets	Continue EV3 Robots	Jen Fowler! Virtual Role Models Presentation	Scratch Projects	Field Trip to spectrUM
12:00 - 1:00	Lunch at Kiwanis	Lunch at Kiwanis	Lunch at Kiwanis	Lunch at Kiwanis	Lunch at Kiwanis
Community Building	Games	Games	Star Power SciGirls Activity	THANK YOU CARDS	Games
1:10 - 2:40	Keep Out SciGirls Activity	Lily Apeadale from 2-3		Makey Makey	Robot Racing Game
2:40 - 3:00	Break at Kiwanis		Break at Kiwanis	Break at Kiwanis	Break at Kiwanis
3:00 - 3:30	Facts vs. Opinions, Closing Circle, Free Play	Good Sources vs. Bad Sources, Free Play	The Scientific Method, Closing Circle, Free Play	Misconceptions, Closing Circle, Free Play	Closing Circle, Camp Certificates, Free Play
Additional Activities	Bonus Cubelets Time	Bonus EV 3 Robots Time	Bonus Ozobots Time	Field Trip to Makerspace	Mo the Robot Dog



What challenges did you face in implementing the *SciGirls* programs? None

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

Area	Rating
Interest in STEM	5
Confidence in doing STEM activities	5
Collaboration with others	5
Developing STEM knowledge	5
Interest in NASA careers	5

Would you recommend *SciGirls in Space* to another educator? Yes.

What would you say? *SciGirls was a great way to get girls interested in scientific jobs and for girls to fulfill their potential*

Comments

No problem recruiting – all our camps fill up. I will send some, along with pictures and the schedule. We did our own family surveys all the families responded that their girls enjoyed the camp with a rating of 5 on a scale of 1-5, One parent said, Of all the camps, SciGirls was her favorite. She said that the group of girls were really nice, so there wasn't a lot of fighting.

WSKG Ithaca, NY <https://wskg.org/scigirls-week-of-stem-camp/>

Type of program	Afterschool Whitney Point School Tioughnioga Academy
Where was the program held?	This program took place as part of a SciGirls after school program at a rural district that often falls between the cracks on receiving services because they are not a title one school.

	This is very rural district where majority of the students are on free/reduced lunch program. Program goes all year
Facilitator background	Science communications; environmental science and biology degree; museum education; found SciGirls 10 years ago
How many SG in Space sessions? How long were they?	4 sessions, 1 hour 40 min each
Month and year	October-Nov 2022
Number of youth	22
Community Type	Rural
Grade levels of youth .	Middle school (6-8)
How many family members were involved? In what ways?	3 provided snacks

Which *SciGirls in Space* resources did you use? Check all that apply.

- Insulator Innovator | Escuadrón Espacial (Space Squad) Episode
- Cloud Clues Activity | SkyGirls Episode
- Mission Patch party
- Other role models from FabFems.org

If other, please describe:

We used Janelle, Mariann, Ayanna from the *SciGirls* NASA Role model - profiles
<https://vimeopro.com/user10550772/scigirls-nasa-role-model-profiles>
<https://sites.google.com/view/scigirlsinspace/role-model-videos?authuser=0>

What challenges did you face in implementing the *SciGirls* programs?

Time constraints, Coordination/managing staff, Facility

If you faced any challenges, please describe them.

The time constraint just refers to the grant timeline. We wanted to do this program with this school - we don't begin school in NY until after Labor day. With school rules of not beginning after school programs the first few weeks of school - this put us into October making the deadline to participate a bit tight for us. I was going to implement this w/ two different after school programs but the second school had issues with getting their afterschool programming off the ground before the grant timeline ended. We still plan on using these activities starting in January of 2023.

Rate the effects that you observed on the youth in your program . 1=no effect, 5=great effect

Area	Rating
Interest in STEM	4
Confidence in doing STEM activities	3
Collaboration with others	3
Developing STEM knowledge	4
Interest in NASA careers	5

Would you recommend *SciGirls in Space* to another educator? Yes,

What would you say? These are quality resources with amazing role models to engage girls. The activities are relevant and interesting, and the role models are diverse in their STEM careers.

Other comments or reflections

I continue to be impressed with the high quality of *SciGirls* programming. I have been lucky enough to work with this program for 13 years and the level of research, quality of role models and implementation is always top notch.

Our program was with a very impoverished community. We did *Girls Who Code* with them. Not a Title 1 school, very small farming community so no special funding. Having a program like this for these girls was huge. They were impressed and excited to meet the role model, Dahlia Santiago Maritas who works in DC.

Appendix B: Open-Ended Responses

Educators

Recommendations

- *I would say that it's a great resource and an addition to existing learning opportunities at school.*
- *It was great! Materials are cheap, lessons are flexible, students were engaged. We had a wonderful response. We've had in-person events before that weren't so successful with middle school. With elementary, the parents sign them up. We had many more sign up. We think there's interest in girl programming. Also interest in space seemed to be a factor. Hands-on activities were also a draw. Hadn't confirmed role model until halfway through the sign up process. Some of the girls said, I love SciGirls..*
- *SciGirls offers a great range of video and hands-on activity resources to encourage girls to strengthen their view of themselves as being capable of being successful scientists.*
- *It's worth the effort. I've done it for seven years. We use the activities in other camps. The activities really work, for both boys and girls. I'm a SciGirls trainer too and in the trainings I've done people really seem to like it.*
- *At Girls Inc. we provide STEM opportunities to girls outside the box and meet the girls where they are (our center) to expose them to these opportunities. Sci Girls has a show that is easy to access anywhere and the girls can also watch other episodes on their own. Sci Girls provides resources that are easy to follow, interesting, as well as diagrams and pictures that are pleasing; and attracts girls to get their attention.*
- *This program is so wonderful at targeting girls and girls of color to keep up interest in STEM fields. I love doing SciGirls programs! I've used a lot of the SG activities in the other things.*
- *SciGirls has great educator resources and promotes diversity.*
- *I would recommend the program. It has great content and resources to engage girls in STEM. The hands on activities were enjoyed by our students and they encouraged girls to work together and encourage one another. The connections to the real women in STEM careers and NASA scientists were very beneficial in helping girls make connections to future careers for themselves.*
- *It would have been beneficial to have been provided with some resources for recruiting and advertising the program. But overall it went really well.*

- *SciGirls in Space has many interactive projects and will get kids excited about space! It is a fabulous program to engage young people in STEM activities and help them make connections to the greater world as well as their local communities.*
- *It is a great way to introduce STEM to girls via fun projects. Girls loved activities. The program has many engaging activities and videos. The activities foster collaborative learning, and empower the girls to think critically as they continually re-design and re-test their projects.*
- *They have great activities and video content. We did other SciGirls videos and activities that were not specifically space related. This was my first summer at the science center. They have always done a girls camp in that age group (4-6th grade). I used SciGirls as curriculum for other camps throughout the summer because it's good, tested, and understandable for counselors (not all have taught). Finding lesson plans that are replicable with very little time for planning. We have supplies specifically for the camps. We write the curriculum, identify the activities, and order the supplies.*
- *These are quality resources with amazing role models to engage girls. The activities are relevant and interesting and the role models are diverse in their STEM careers*

Other Comments

- *We've found that boys don't care that women are the role models. The boys were asking to participate. I did code.org with the boys, and some Minecraft things. One role model on video was transgender and that was great for some of our students, just keep the path and find mentors to guide you. I had them start digital portfolios with the things they did and created in a google slide show so their STEM identity. I started a lab room in TikTok that was inspired by this project. One student who an artist do a huge drawing of the Hubble. Her eyes lit up when she heard one of the role models said she was an artist.*
- *Part of our NASA Community Anchor program is reaching out to rural schools, mainly sending them things, since they can't come down to Bangor. We also have two other girl events planned like doing a virtual mission with a role model. Plan to use the Insulator activity. Working together with Portland Children's Museum.*
- *I wanted them to get a taste of project-based learning – not super deep since we only had four hours a day. Another activity was excavating buckets of dirt, rocks, plastic, then characterize the alien civilization. Because there were only six, I asked them what they wanted to do, so I changed up the schedule because one girl wants to be an engineer. We teach them about anatomy through dissections and a cardiologist do a dissection of a sheep heart. One girl who was squeamish said afterwards it was awesome. One girl has been to SciGirls three years in a row. Three girls were new. I was impressed with how quickly a role model got set up for us when one of the girls said she wanted to be an engineer. It was very easy and role model was great.*
- *One student had to leave early one day, but I told my mom I don't want to because this is the best summer camp I have ever been to. Her mom said that her other children were jealous. Students didn't report any issues or needs: "it was perfect the way it was." Failure in science are the norm. We talked about NASA's missions. I learned it's okay to fail. That it will probably happen in science. Seeing Jenn in a NASA position was really important to them. Many said they enjoyed collaboration and learned to work together.*
- *We completed the program last night and it was so successful! We had a wonderful four weeks and the parent celebration was a lot of fun! The parents enjoyed seeing their students' work and engaged with a NASA JPL scientist virtually.*
- *Thank you so much to the funders and teachers of Project Scientist!! I know our participants here in Charlotte will miss the social interactions with each other, as well as with the teacher Ms. Jacki, both virtually and in-person! It may also be fun to have a 'big teach' meetup of all the local kids for a fun competition with the various STEM activities, or something that is team-building so the kids can meet other STEM Club participants. Just a thought. Thanks again!!*

- *A number of parents were unhappy about the gender sections in the girls' questionnaire. I think it should be printed on a separate page to be given to the girls at parent's discretion.*
- *I enjoyed working with the girls and watching them explore through fun and forming friendships.*
- *I continue to be impressed with the high quality of SciGirls programming. I have been lucky enough to work with this program for 13 years and the level of research, quality of role models and implementation is always top notch. Our program was with a very impoverished community. We did Girls Who Code with them. Not a Title I school, very small farming community so no special funding. Having a program like this for these girls was huge. They were impressed and excited to meet the role model, Dahlia Santiago Maritas who works in DC.*
- *In addition to our NASA mentor, we also included one of her grad students in our presentation, and we had three female college student interns who helped with activities. The Dakota Stars was so special and it had the art in there too. The girls were asking such in-depth questions of the role model about her work on Mars Mission. She had instruments on a satellite orbiting Mars. She was involved with Perseverance and Opportunity, and involved in the planning of other missions. She didn't have a straight line into her position so the girls were fascinated with that.*
- *Our girls who participated this summer in programming really enjoyed this; so much that we are continuing with this group during our fall programming in outreach in the schools (N=60). We are also planning to take a few of the most interested girls from this summer to the space museum in Birmingham AL. We are hoping to stay on site and working to have the entire trip sponsored.*
- *We did not have problems with recruitment since I do other clubs and the teachers got behind it. We heavily recruit for all our summer camps. I recruited five girls from our STEM Honors society and made them mini mentors. They were great!*
- *I would love to see more activities to choose from in the future. We're always looking for as much content as we can get. I would love to see more activities about space that youth can do in 30-45 minute. Having the activities in one place would also be helpful.*
- *It would have been beneficial to have been provided with some resources for recruiting and advertising the program. But overall it went really well.*

Youth Responses: Why did you sign up for SciGirls in Space?

- *I thought it would be fun (15)*
- *I am really interested in science (13)*
- *I like space (5)*
- *I thought I would try something new (5)*
- *Mom (5)*
- *Class activity (4)*
- *Teacher (3)*
- *Friends (2)*
- *Fun (2)*
- *Art*
- *Email*
- *Feel like I can become someone that gets to go to Neptune*
- *I love the sky we all share*
- *I want to learn more about NASA*
- *It looked interesting and to learn more*
- *It sounded cool*
- *My aunt*
- *Sign for Girls Create*
- *To learn more about our world*
- *To learn more about Space and Stars*

What did you like best?

Everything (11)

Learning

- *Learning about light pollution*
- *Learning about the stars*
- *Neptune*
- *What I learned about space science*
- *NASA*
- *Learning about moon rocks*
- *I enjoyed learning new things.*
- *Learning from the NASA workshop*
- *Learning about space*
- *I enjoyed learning about the missions.*
- *The part where I learned about the planets and learn kinda about each one*
- *Neutral Buoyancy Lab*

Role models

- *Videos and learning about other girls (3)*
- *I liked when we watched the video about the Native American girls.*
- *The NASA lady*
- *Doctor from NASA*
- *Meeting someone from NASA and learning about space*
- *Meeting the NASA engineer*
- *Meeting the lady that worked at NASA*
- *The live interview with the NASA scientist*
- *What I liked was that I get to see all the portraits*
- *The profiles on their website*
- *The video call with the NASA scientist*
- *The day we got to meet someone from NASA*
- *Learning about plans and what other people want to be.*

Activities

- *Constellation box activity (8)*
- *Art, drawing, coloring, musci (10)*
- *Hands on activities (5)*
- *Oreo moon phases (3)*
- *Water bottle project (4)*
- *When we got to go into the planetarium; it was pitch black (3)*
- *Maze (2)*
- *Catapults*
- *Building the bridge*
- *Having the opportunity to do STEM related activities every day.*
- *I liked the activities where we problem solved and I was in Mission Control*
- *The summit, I really enjoyed it and feel like I learned a lot.*
- *Constellation craft*
- *Cup holder*

- *Oregon trail*
- *Making slime*
- *Smashing with the pendulum and the meteor experiment*
- *The information we learned and the activities we got to do.*
- *I liked making and testing a parachute the best*
- *The activities we did (and the freeze-dried food)*
- *Cloud clues*

Robots/rockets

- *The Rovers, racing the rovers (9)*
- *I liked building the robotic Legos the best.*
- *The drones*
- *I liked making solar cockroaches.*
- *When we built our rockets, then put the Alka Seltzer in them and they blasted off.*
- *Coding robots*

Friends/teamwork

- *Friends, getting to know other people (9)*
- *Making the patches (3)*
- *Being with my friends, learning about space, having fun*
- *All the girls were kind to me*
- *The friendly, safe and welcoming community.*
- *Making projects with my friends*
- *I liked working with the other people doing the hands on activities*

What did you learn about space science?

- *Star science/constellations (10)*
- *Moon phases and gravity on the moon (9)*
- *Rovers/robots (5)*
- *Different types of clouds (4)*
- *Moon phases (4)*
- *Artemis (4)*
- *It is awesome/cool (4)*
- *How space suits are made (2)*
- *I kind of already knew everything. (2)*
- *How light pollution affects the stars*
- *When it is brighter you cannot see the stars as much but when it is dark you can see them,*
- *Heliocentric and geocentric models, moon phases, Earth's layers, classify galaxies, gravity, Big Bang theory, planet mass, our galaxies*
- *That galaxies can collide*
- *Light pollution*
- *Working together makes a difference.*
- *A lot of stuff about gravity*
- *How they drill in rocks*
- *Nothing much just saw role models*
- *I learned how some people make storms smaller*
- *I learned about payloads*
- *That we on Earth can also help with NASA programs.*

- *All different names of space labs*
- *That some programs might be for me.*
- *About space and the sun*
- *Other planets*
- *3D printing*
- *Building a boat*
- *How to build a solar car*
- *Crafts, beading, and 3D printing*
- *We all share the same sky*
- *It is fun*
- *You can do anything.*
- *There are different ways to learn space science*
- *NASA*
- *I learned it takes 7 months to get to Mars*
- *How they travel through space*
- *I learned more about Native American science*
- *Sign of water on the moon*
- *Venus has more than one moon*
- *Orange rocks on the moon*
- *Space exploration. New mission*
- *The first woman is going to the moon.*
- *The moon has a darker spot because of volcanic eruptions*
- *I learned what the orange spot were*
- *Light pollution*
- *I learned that that there are many games and many portraits.*
- *There's a lot of things that are with science.*
- *Engineering and STEM.*
- *NASA is planning to return to the moon in September*
- *I learned about the first woman to pilot a shuttle operation, Eileen Collins.*
- *Space science is important for our country and that girls can be space scientists too.*
- *I learned a lot from the speakers.*
- *I learned more about female astronauts and NASA.*
- *They have STEM jobs besides being an astronaut.*
- *I learned some ways we might calculate what we need for space travel and other things before actually going to space. I also learned how people figure out possible errors and what needs to happen because you can't really have errors in the field.*
- *That solar power is a great source of energy*
- *I learned about the moon and how spaceships are developed and launched.*
- *I learned that the moon phases all mean something different*
- *How much fuel a rocket needs to blast off.*
- *The impact crater depends on mass and velocity of the meteor*
- *I learned about space exploration, mars, the engineering process of sending people to space/mars*
- *I never realized how big space is.*
- *We learned about stars, light pollution, space exploration, Mars.*
- *I learned lots of things but I learned that could become a space scientist and work for NASA if I work hard and do well in school.*
- *I learned about observing stars, light pollution, and Mars.*
- *About building and landing things on the moon and Mars*

- *We made hovercrafts.*
- *We were able to talk to a Dr. who works at NASA.*
- *That Pluto isn't really a planet cause its so far away from the sun it's basically a ball of ice and last time I remembered it broke into 3 pieces*
- *That nobody has actually been on Mars*
- *What people did at NASA where the people went to when they were in space*
- *I learned about what the people did in space and what they ate.*
- *The missions they went on and what job the woman worked at NASA has*
- *What people do in space and kind of like how they do it*

What space science topics do you want to know more about?

- *How to find constellations*
- *Planets and biology*
- *Astronomy, astrophysics, aerospace engineering*
- *Weather*
- *Gravity*
- *Astronauts*
- *Rovers and clouds*
- *Stars and the galaxy*
- *Rovers*
- *Space*
- *How they build rockets*
- *Extraterrestrial life on other planets*
- *Human health and wellness*
- *Gravity*
- *I want to know more about how rovers work.*
- *Astronomy*
- *Artemis*
- *Moon*
- *Stars*
- *Why did we come here*
- *How to create more*
- *Robots*
- *Planets*
- *The boats*
- *3D Printing*
- *Animals*
- *Galaxies*
- *How the moon affects Earth*
- *Stars and spirals*
- *How they make the stethoscope*
- *All of it*
- *Stars*
- *Astrobiology*
- *What it is like inside a spaceship*
- *Constellations*
- *Is there aliens out there?*
- *I heard about a thing where the Earth blocks the sun from the moon. That sounds cool!*

- *What is on planets*
- *The moon and Jupiter*
- *The stars*
- *Astrology*
- *Every single one*
- *Everything*
- *Our body*
- *Black holes*
- *Dissecting animals*
- *Solar science*
- *Everything*
- *Solar system*
- *Neptune*
- *The moon*
- *The moon*
- *More about NASA*
- *Planets*
- *Stars*
- *Astronomy*
- *Constellations*
- *Astronomy*
- *More about the stars*
- *Stars*
- *Astronomy*
- *Moon rocks*
- *Launching the rocket*
- *The moon*
- *Rocks*
- *Exoplanets*
- *Space rocks*
- *I like using a microscope to see what is inside things*
- *How does gravity work*
- *STEM*
- *Different galaxies*
- *I want to know more about plants growing in space.*
- *I would want to know more about space exploration and finding life on other planets.*
- *I would like to know more about astrophysics.*
- *Terraforming.*
- *mars*
- *It would be interesting to learn more about far away planets and exploration. Not necessarily looking for life forms just learning new things about new planets.*
- *Space travel*
- *I would like to know more about habitats on other planets.*
- *life science or cells*
- *How the universe was made.*
- *Life on Mars*
- *Our solar system, other stars and galaxies, how do we know about outer space*
- *Telescopes and building spacecrafts*

- *I don't know*
- *The future mission to Mars and astronauts going to space*
- *Building rockets*
- *Planets would be a cool one*
- *The planets*
- *What's beyond space*
- *NASA*
- *Tree*
- *The moon*
- *Why Pluto isn't considered a planet.*
- *About the galaxy and the moon, moon texture and what its probably formed of*
- *The sun*
- *The planets*
- *I want to learn more about all of the planets*
- *The planets*
- *I want to learn more about planets*

Why or why not? Please explain.

- *Because I care a lot about animals including frogs so I want to protect them.*
- *They like performing scientific experiments to figure things out.*
- *One of them plays soccer.*
- *They were close friends.*
- *I can relate because they both like space like I do.*
- *They were not as busy as me.*
- *Because I would like to do some of the things they do.*
- *They were given amazing opportunities just like we were.*
- *Because the people were around my age.*
- *Because I am like them.*
- *Some because I like space.*
- *Because I still don't know what I want to be when I grow up.*
- *I thought the ideas were cool.*
- *I did not investigate space.*
- *Because they were older and more experienced.*
- *They were like me.*
- *I saw all of them liked the amazing images of space.*
- *I am passionate about science.*
- *Some of them were the same.*
- *Because I am not really into what there were talking about some of the time.*
- *I like constellations but I do not like to study them.*
- *I like stars.*
- *Because some had the same interests as me.*
- *Because I never give up*
- *This was my first time doing something with NASA. So I'm just getting into it.*
- *I am not very smart and I am lonely.*
- *I am very fascinated by space.*
- *I love star gauzing.*
- *A girl*
- *I can relate to all of the videos myself.*

- *Because of the girls*
- *Most sci girls look too real.*
- *I am not as out there as some of these girls.*
- *Some of them were very kind and like they can be my friends.*
- *I saw many girls not just girls like me*
- *Some of them like art.*
- *I want to be a math or science teacher.*
- *Some of them were understandable.*
- *I am able to relate to them because I am Native American.*
- *Don't really have the resources like the girls.*
- *I am not super interested in space but I like constellations.*
- *I don't like space science.*
- *I never went star gazing.*
- *Don't like science.*
- *I think I relate some because I already did a plane to see the stars.*
- *I like looking at stars.*
- *Not super into space and rocks.*
- *Because I want to take care of people and work at Chick-fil-A.*
- *I can relate to the girls in the video by doing cool experience like they did in the video.*
- *Cause I want to be a doctor.*
- *We shared similar interests like music and sports.*
- *The girls in the SciGirls show seem very similar to me, because they also like science and want to make changes for the better.*
- *I was able to relate to the girls in videos because I usual try to find healthy options to eat and the girls in the videos were also trying to find healthier food recipes.*
- *I was able to relate to some things.*
- *I'm not really interested in nutrition.*
- *The group was trying to solve an issues*
- *I felt that it made sense and some of it sounded interesting but I couldn't always connect with some of the things the girls were doing.*
- *They are the same age as me*
- *I could see why they did the things they did, but I don't really have any interest in the fields they talked about.*
- *The girls are my age.*
- *I could grow up to be like them.*
- *The girls in the videos were my age, but they were able to do more science stuff than I can.*
- *They were my age and they asked some of the same questions i would ask.*
- *Same age, interested in the same things as me.*
- *They seemed like girls my age and were interested in learning*
- *They were my age and like science.*
- *They were kind of the same and me but not completely,*
- *We didn't watch any videos, I think. (I may be wrong)*
- *I am not a scientist, but I can understand what they do.*
- *I had not paid much attention to the video, so I can't relate as much as other students.*
- *Because they seemed to have a lot of fun doing projects a socializing with other people which seems fun.*
- *I like to make things that you can use and that will be helpful.*
- *I can't remember the video*

- *I relate to the girls a little bit because I love science and it really interests me*
- *I can't remember it very well, because i can work as hard as i can to get things done.*
- *I think I kind of connected to the girls because I like science and I want to learn a lot about space.*

Did seeing the girls give you ideas for things you could do in your own life? If so, what?

- *Be an astronaut*
- *Geology*
- *I am going to launch rockets at home. I have dropped eggs from the window with my own parachute and made a catapult with popsicle sticks to launch marshmallows at my family.*
- *I believe this can help me get into zoology.*
- *i could find people in my community to help me grow and learn*
- *I could make stuff for space or learn more about space*
- *I liked that they were making a holder thing for the baby*
- *I thought about possible fields I could go into that were mentioned or referenced.*
- *I would like to do more and learn more about science and space*
- *It was a long time ago. I don't remember.*
- *maybe, I would like to be able to do some of the things they did*
- *The girls gave me ideas to do my own science experiments at home*
- *They made me think I could do science projects at home and maybe be some kind of scientist when I'm older*
- *I learned how to be better in eating healthy/how to make new healthy foods!*
- *About how much better on Stem.*
- *It gave me ideas for making practical things*
- *By becoming a good scientist*
- *Making more games*
- *That I can do research projects on my own as well*
- *The girls gave me ideas of finding healthier recipes to make.*
- *I learned about what majors to think about in college.*
- *Artemis*
- *Astronaut*
- *Be a scientists*
- *Be an astronaut*
- *Being a pilot*
- *Being an environmentalists*
- *Being a pilot at NASA*
- *Build more homes for animals*
- *Building stuff*
- *Can learn about the moon more*
- *Catching turtles and frogs*
- *Coding and creating games*
- *Coding architecture*
- *Create and design*
- *Doing activities with my friends*
- *Going out at night on my porch and looking at constellations*
- *Help the environment, stop light pollution*
- *I can learn more about the Native American stars and learn hoe to bead*
- *I could be an engineer*
- *I could learn to play the violin*

- *I could work at NASA*
- *I like computer science.*
- *I might be an astrologist*
- *I would experiment with fresh water*
- *Learn more about constellations and their stories.*
- *Learning more about constellations*
- *Looking for stars*
- *Make an ice cream bike*
- *Making games*
- *Star gazing*
- *Studying rocks*
- *The innovative space study*
- *They gave me some ideas on ways to make my food healthier and changes that I can make to make everyday life healthier and better.*
- *To be in NASA*
- *To be more active and do more research of my own.*
- *Working as a NASA intern and being a tester.*
- *Working at NASA*
- *You can always go and explore.*

For the skill you learned the most about from the list above, please explain how you got better.

- *I learned how to work with a team*
- *I use to hang around in the back during group projects and now I participate all the time.*
- *I asked more questions*
- *Clouds - 12 types*
- *I got better because I kept trying*
- *I learned to accept it*
- *Teamwork*
- *I learned it is OK to make mistakes and I got better at working together because we had group projects.*
- *Listening and having fun*
- *Making mistakes. Before I thought it was good and bad to make mistakes and now I am sure to learn from them.*
- *I got better because other girls were motivating me as well as the teachers.*
- *I learned to work together*
- *Learn from your mistakes and eat more snacks*
- *Working together*
- *My first day*
- *Creative and unique*
- *Working together*
- *Motivation*
- *Asking questions and exploring*
- *The videos*
- *I saw how others were motivated and did it as well.*
- *Making a difference. Sometimes I just let things happen, but during a few activities I let my ideas be heard.*
- *Patience*
- *Constellations*

- *The videos*
- *Being creative because I was very creative in the WB change*
- *Identifying constellations*
- *You can learn from your mistakes*
- *I learned how I could help my community with STEM*
- *Teamwork*
- *Making a difference.*
- *Being creative*
- *Being OK with making mistakes*
- *I was able to motivate others if they felt like giving up*
- *I got better at using STEM by the water bottle activity*
- *I use to work alone for everything and then I started working with the others*
- *I worked with my friends to solve problems*
- *Drawing stars*
- *Making mistakes is important*
- *Being creative and unique. I chose a constellation that looks like a jellyfish*
- *I was learning more and then I got better!*
- *By doing better things with it*
- *I got better at STEM and helping each other.*
- *It's easier and more fun to work together when you have a good team.*
- *I learned how to better your community with STEM. before I only thought of big ways that I wasn't able to do but now I see that there are small things you can do to help.*
- *I got better at feeling that I can learn from my mistakes; before, I tried avoiding mistakes, after SciGirls, I felt that it's ok to make mistakes as long as I can learn from them.*
- *I am still learning about how STEM can solve community problems.*
- *Asking questions and exploring, I improved the most on this by Bing more comfortable asking because i got practice.*
- *recording data is important*
- *I think I could better use STEM to solve community problems now because I better understand how far STEM branches out and different ideas it covers. I think you could use engineering to solve problems in the community such as structural issues and other such things.*
- *builds confidence*
- *I learned how STEM could impact my community and how it could help others around me.*
- *Just keep trying*
- *I am really good at motivating others.*
- *Making things and being creative are my favorite. I like to draw out my ideas before I try to build them.*
- *I did not like to make mistakes. I like to get things right the first time. When we were working on projects together though I learned that there isn't always a perfect way. sometimes, you have to try things that don't work to learn what does work.*
- *I learned some skills to help encourage and motivate others. I wasn't very good at that but when we worked together our leaders encouraged us and showed us how to encourage each other so we could be successful*
- *i learned about the people in my community that could help me learn more about science and how using community people could help me in life as a mentor*
- *I probably got better the most at asking questions and exploring. I got better at being confident in asking questions because if you don't ask questions then you can't learn the answers.*

- *i probably learned the most about encouraging others, when we had to make things, or work together it was important that everyone felt included and participated*
- *we got better at working together because we had to work together to brainstorm ideas and build our parachute landers*
- *They all stayed the same for me.*
- *I got a lot better at learning from my mistakes. I used to get really upset and now I don't.*
- *It was the same*
- *Learning*
- *I wasn't here*
- *I progressed in solving community problems by helping my friends with work.*
- *Idk just listening how to/ what is going on a learning from it and making it better my way*
- *the skill that I think I improved in is working together I used to not like working with people because I am very shy and I am still shy but not as much and I understand that working together is good.*
- *I didn't know you could use STEM to solve community problems but then at the end of the day I learned that you can*
- *I'm not very good at solving community problems so I didn't really get any better*
- *asking Questions is a little hard for me if its some I don't know I also have a little social anxiety.*
- *I didn't get better I'm not good at solving community problems*

What would you say to them?

- *Learn a lot (13)*
- *It is very fun (11)*
- *That you makes friends (10)*
- *Do it! (8)*
- *Go to SciGirls (7)*
- *It was cool (3)*
- *It is an amazing program*
- *It is really awesome. It was a really great experience*
- *It's a good program to learn about STEM and NASA*
- *You would like it.*
- *If you like space, do this.*
- *I think you should do this program to learn more about the world we live on.*
- *You get to hear other people's stories and maybe you'll be inspired*
- *This could help them pursue their career in the future so it is a great source, boost and opportunity*
- *That this program is very well make and extremely fun*
- *That it is a fun camp and you learn a lot about space*
- *I think you would like it*
- *This is an amazing program for kids*
- *You should try to check out SciGirls.*
- *I would recommend SciGirls*
- *So the SciGirls program because you can learn and have fun*
- *It is amazing and awesome and will change your life!*
- *You can learn about NASA and STEM at SciGirls in Space*
- *That it helped me get more ideas*
- *Being Native American connected to STEM*
- *You should check out the SciGirls. I learned a lot about stars*
- *SciGirls is very informative*
- *Please learn about stars*

- *It is kind of boring but interesting*
- *It was fun but frustrating activity wise*
- *I would recommend this to you*
- *Welcome to sci girls you are now a sci girl!!!!*
- *Thank you for teaching me new things!*
- *Welcome to SciGirls you are now a SciGirl.*
- *It's really fun and you get to do cool experiments.*
- *SciGirls in Space was an amazing opportunity where I got to learn about my favorite STEM topics, meet cool people in STEM, and overall just do fun STEM related activities.*
- *I could say that SciGirls in Space is an inspiring program for those interested in STEM and/or Space.*
- *It was super fun and I made two good new friends. The activities were so fun. You should definitely do it!*
- *I did this cool program, and I thought it was pretty fun! You would probably like it to!*
- *My friends and I were able to conduct our own research and figure out the answers.*
- *I appreciate what you are trying to do to encourage women in STEM fields and appreciate the funding and content created for us to use to further ourselves.*
- *That it is fun and you will learn new things*
- *That it is a program that is good, but only if you actually want to go into STEM.*
- *I would have said that the video is a fun video that you can learn from and take notes*
- *I would say that it is really fun and they should at least try one day of it to see if they like it.*
- *We get to make a mess and have fun learning about science.*
- *SciGirls was really fun and I learned a lot of information*
- *It is a lot of fun and it gives you the chance to do hands on things with friends and learn about space*
- *I would recommend it to other girls who are already interested in science but not really for girls that don't like science.*
- *SciGirls was a cool way to learn about how you could make a career in science and NASA*
- *This was a fun afterschool activity and you get to learn and make things*
- *It's a really cool experience for those who love to learn about space as much as me*
- *Do right and right will come to you.*
- *I don't like science.*
- *I'd explain how fun it is and that you could make more friends if you wanted to.*
- *Hey I have this cool club that is after school it's really fun and I think you would love it*
- *In Sci-girls you learn about very interesting things and it is very fun to make new friends and meet new people who have the same interests and you do.*
- *SciGirls in Space is really fun and helps you learn more things about space.*
- *You should really try SciGirls in space it is really fun and you learn a lot and have fun too!*
- *it very fun to learn about space and how it gets explored also its cool to see how they go about putting something into space.*
- *"Hey you should try out SciGirls in space its really cool*

Other comments or suggestions?

- *Sign up, it is really fun*
- *It can show you other girls like you.*
- *What is science mostly about?*
- *I think you could be better at advertising the STEM camps like Artemis Academy or SciGirls, because a lot of people don't know about it.*
- *I do not recall watching short videos about women that could have inspired me to think about a career at NASA or in STEM.*

- *You should talk more about Terraforming and cosmonauts.*
- *Thank you for making science fun 😊*
- *This was fun, I hope we can do it again sometime*

Family Responses

What did your child say about SciGirls in Space experience?

- *Amazing*
- *Was initially reluctant by definitely began to enjoy experience*
- *It was a great experience*
- *She enjoyed*
- *She liked it but thought it might be too basic/fundamental for her.*
- *It was great - wants to do more.*
- *Learned a lot of terms. Really excited about experiments*
- *Have had lots of fun. Interested in climate, astronomy and space*
- *Everything was cool. We got to see a space suit.*
- *She really loved learning a out space and engineering*
- *She came home everyday excited to tell me what happened at camp.*
- *She is now thinking of working for NASA when it was not really in the top 10 before.*
- *Said that she was loving it*
- *She loved the STEM activities*
- *Excited for SciGirls experiences. Liked working in groups.*
- *My daughter came home excited to discuss her experiences*
- *It was awesome*
- *She didn't stop talking about SciGirls for the whole week! She shared everything she did and learned. She also mentioned she wants to work on the mission to Mars.*
- *She mentioned having a wonderful time and would love to come back next year.*
- *That they let them touch different materials and that she had fun.*
- *She liked doing activities*
- *Fun*
- *She loved it*
- *She loved learning about the constellations!*
- *Loved it!*
- *It was fun and excited to do more.*
- *She enjoyed it but there were too many videos*
- *She rated it 1000 out of 5! Awesome, awesome, awesome! And really really fun.*
- *Loved it!*
- *Lilly has Alport's genetic kidney disease. She is 9 years old and this disease effects your eyes and hearing. As grandma, I want her to see and hear everything while she can.*
- *She liked the show inside the theater. I think she got bored during the show in the classroom. So maybe more hands on and speakers to engage with them.*
- *It was fun and better than expected*
- *Emily really enjoyed the program overall. Some of her favorite parts were the guest speakers, programming and making new friends. She did mention that she thought she would learn a bit more than she feels she did. Emily would be interested in future programs like this one.*
- *She loved it. She was really grateful to have this experience.*
- *Loved it!!! was excited to go each day.*
- *Our child was extremely excited to have had the opportunity to experience SciGirls in Space, participating in projects, hearing and speaking with Astronauts live; and hearing from panel of*

distinguished speakers. The environment was safe; and teachers and staff were caring and supportive of the children.

- *She absolutely loved it! She was excited to go every day and was excited about the hands on projects and was inspired by all of the female scientists.*
- *Fun activities (rocket build, drone build, some kind of mars/space live action type problem solving mission was a major highlight)*
- *Very interesting and inspiring*
- *She has been a sci-girl for the last 5 years. Lol It was good to see the group make some headway though.*
- *Incredible! When is the next one & am I signed up for it yet?*
- *GOOD*
- *She loves the hands on work and getting to take the kit home at the end of the unit. She thinks it's a little too much talking.*
- *How exciting it was to make craters in the moon*
- *She had fun creating and experimenting with girls her age. She looks forward each week to Project Scientist!*
- *She enjoyed the most when he was doing the activities.*
- *My child said that they loved learning about Space, hearing from a real NASA scientist and being with other girls that liked science as much they do.*
- *My daughter loved the hands on activities, the science videos, and the NASA scientist*
- *She said it was fun and she learned a lot about science and space.*
- *She loves everything about the Project Scientist Program*
- *They enjoyed asking questions.*
- *She was just excited about everything they did each day.*
- *She enjoyed*
- *She loves science. She had a great time.*
- *She talks all the time about the program. She loves it. All the activities- the teachers. It's all great*
- *She likes doing experiments with her friends. She likes having special guests come into class. She likes being with her friends*

What would you say to them about the SciGirls in Space program?

- *We loved it!*
- *Great learning experience for girls interested in STEM*
- *That it is a fun program - experiencing things that we ordinarily would not and longer... more meeting.*
- *It is a great way to expose your child to the wonders of science in space.*
- *Do it!*
- *Wonderful positive experience to get them excited about science and space.*
- *Great opportunity to learn about space and the importance and girls/women.*
- *Wonderful opportunity/experience. Loved coming every day.*
- *It is a great experience for STEM activities*
- *Fantastic and interesting program*
- *I thought it was well put together and my daughter absolutely loved it.*
- *My child had an amazing time learning about space and would love to do it again.*
- *It is a fun program that encourages girls to look at many new career opportunities. They kept the girls working and engaged.*
- *Continue what you do. Opportunities and involvement with girls at this age is great.*

- *This is a great way to introduce or expand a young child's knowledge about science and experimentation.*
- *Great confidence builder*
- *This is a very motivating experience for girls that are creative and science inclined.*
- *This is a wonderful opportunity and I would love to keep my girls involved in any way I could in the future.*
- *I am so excited that our girls have this wonderful educational opportunity.*
- *A great motivator for my girl who is shy and getting her out of her comfort zone.*
- *More activities like this*
- *It is a wonderful informative program for girls.*
- *A wonderful experience and introduction to women in science.*
- *Do it!*
- *It seems like a great intro and motivation!*
- *This is the first encounter we have had with the program, but this was great!*
- *It was a great experience for our family.*
- *It was an amazing experience. Lilly and I really enjoyed it. The stories and art was fun and we learned so much.*
- *Great education and opportunity*
- *The SciGirls in Space program gave my daughter the chance to explore current knowledge and ideas about space with other girls her age with similar interests. She enjoyed the hands on activities and guest speakers. I wouldn't hesitate to enroll her again, and I'm sure your daughter would love the program as well!*
- *It's such a great opportunity for girls to get inspired and excited about STEM*
- *It's a very motivating program for Girls.*
- *It is a great STEM program for girls!*
- *It's an amazing program and really helps to foster confidence and curiosity in STEM*
- *Girl centered Space education opportunity - fun and challenging*
- *Very informative and a fun experience*
- *We mentioned it a lot and the girls we spoke to about it were very interested and wanted our help to get them enrolled and signed up for information.*
- *How can I help you join?*
- ***IF YOU ARE INTERESTED IN SPACE, IT'S PERFECT OPPORTUNITY TO JOIN.***
- *My daughter loves getting to do projects and experiments! I love that it's accessible (free) and at a library in our community.*
- *It is really fascinating*
- *You can have fun learning about science.*
- *this program may help open up a talent they never knew they had*
- *SciGirls encourages young women to be confident in their science abilities and allows them to see a future for them in science.*
- *the SciGirls in Space program was a great activity for my daughter to get involved in. She loved learning about science and girls in science.*
- *Asking a lot of questions*
- *I would recommend it. It was good quality science programming that encourages girls in STEM*
- *Exposing girls to STEM and space at such a young age awakens their imagination and shows them that girls can be scientist.*
- *Very inspiring*
- *Girls need to do this!*
- *Is interested and May helps other girls experience NASA*

- *It's a wonderful idea to get these girls together to do experiments and learn together. Build friendships and help each other.*
- *It's excellent. Your child will love it*
- *Excellent way to get your girls involved in science. My daughter loves this program.*

Other comments or suggestions

- *Please do not add gender identity questions on the girls form without prior permission from parent.*
- *I will spread the word to other to experience this.*
- *Very much enjoyed this!*
- *Thank you!*
- *It was awesome!*
- *The speaker was fantastic! I wish her talk was recorded to show my students.*
- *I want to thank you for inviting us to this SciGirls in Space program. Driving to Rino was so worth it.*
- *Was to engage all of the SciGirls of all ages and attention spans and ways to get them comfortable and talking.*
- *Thank you for the opportunity*
- *Emily had a wonderful time and enjoyed new experiences. Meeting Eileen Collins was definitely a highlight for her. Overall, the program was fantastic, but she did express that she would've liked if there were more challenging parts and time to be more creative.*
- *We are so grateful for SciGirls and Artemis Academy. My daughter has loved every minute of it!*
- *Can't wait till the next event.*
- *We would like to thank the program and everyone for giving our daughter an opportunity to experience the program!*
- *We are so grateful for this program!*
- *We enjoyed the experience, and it was amazing for our sci-girl to come home and talk about the fun she had in learning an entirely new field of science to her you her sister! With today's antics there is nothing more important than supporting and encouraging girls to step into the unknown and break through the glass barriers than now. We absolutely loved the program & you have 2 attendee's coming back from this household plus any other girl we can fit in the car to get there this next year... many many thanks to the program directors, facility sponsors, community sponsors, and the program itself! Thank you from the bottom of our hearts!*
- *Added note... we are so excited about the Artemis program that our girl wore her Artemis camp shirt to school to support the launch yesterday (that was delayed) but wanted to miss school entirely to watch and listen to every step! She set timers to go off based on CST converted from the ET times given. Having a child that works twice as hard as any neurotypical child be this excited about a project and field of study is honestly heart grabbing! It's because of you and the program as a whole! Thank you... we will be in attendance Friday for the next launch 🚀*
- **MORE HANDS ON ACTIVITIES**
- *My daughter really liked getting the snacks since the program is right after school and she's usually really hungry.*
- *Thank you for these wonderful opportunities ♡.*
- *Great program. The PARI staff and teacher did a great job working with our girls.*
- *I wish this program lasted longer, or was offered again.*
- *None*
- *Thank you for bringing Sci Girls to our school.*
- *Thank you for making this happen*

Appendix C: Measures

SciGirls in Space Post Program Reflection Summer 2022 - Educators

Dear educator: Thank you for taking a few minutes to complete this survey after you run the SciGirls in Space program. We appreciate that you are helping us to capture how you are using the SciGirls resources and the audiences you are serving.

Your name (for tracking completion only; your responses are confidential)

Your organization

Type of program

- School-based program
- Afterschool program
- Evening program
- Weekend program
- Summer program
- Other

If other, please describe _____

Please tell us more about the type of program in which you facilitated SciGirls in Space.

Where was the program held?

- School
- Community center
- Museum/science center
- Public library

If other, please describe _____

How many SG in Space sessions did you have with the girls? How long were they? _____

In which year and month(s) was your SciGirls in Space program held? _____

Which SciGirls in Space resources did you use? Check all that apply.

- Insulator Innovator | Escuadrón Espacial (Space Squad) Episode
- Cloud Clues Activity | SkyGirls Episode
- Star Power | Star Power Episode
- Grab and Go Activity | Deep Sea Diver Activity | Aquabots Episode
- Phototropism: Do Plants Prefer the Blues?
- Role Model Video: Space Station Explorers (girls who flew their experiments on the ISS)
- Role Model Video: NASA Engineer, Alma Stephanie Tapia
- Role Model Video: NASA Intern, Kirsi
- Other role models from FabFems.org
- Astronaut biography – Christina Koch
- Astronaut biography – Anne McClain
- Astronaut biography – Jessica U. Meir
- Other: please describe _____

What challenges did you face in implementing the SciGirls programs? Check all that apply.

- Recruiting girls to attend/stay
- Managing participant
- Time constraints
- Coordination/managing staff
- Supplies/material issues
- Facility
- None
- Other

If other: please describe _____

If you faced any challenges, please describe them and how you overcame them. This is especially helpful to the staff in supporting other educators in the future who use SG in Space.

Number of youth who participated in the SciGirls in Space program _____

Grade levels of youth participants

- Upper elementary (4-5)
- Middle school (6-8)
- High school (9-12)
- Other: please describe _____

Community Type

- Urban
- Suburban
- Rural
- Other: please describe _____

How many family members were involved? _____ In what ways?

Rate the effects that you observed on the youth in your program in each area. 1=no effect, 5=great effect

Interest in STEM	1	2	3	4	5
Confidence in doing STEM activities	1	2	3	4	5
Collaboration with others	1	2	3	4	5
Developing STEM knowledge	1	2	3	4	5
Interest in NASA careers	1	2	3	4	5
Interest in STEM	1	2	3	4	5
Confidence in doing STEM activities	1	2	3	4	5
Collaboration with others	1	2	3	4	5
Developing STEM knowledge	1	2	3	4	5
Interest in NASA careers	1	2	3	4	5

Would you recommend SciGirls in Space to another educator?

Yes No Maybe

What would you say?

Other comments or reflections

***SciGirls in Space* Family Survey – Summer 2022**

Dear *SciGirls* family member, Thank you for giving us your perspective on your child’s experience in *SciGirls*. We are looking forward to your observations and comments.

Location of your child's *SciGirls in Space* experience (city, state, institution)

Overall, how much did they like it? (circle one)

Not at all

A little

Quite a bit

A lot

What did your child say about SciGirls in Space experience?

Did they mention any of these things as important? 1=not important, 5=very important or DK for don't know

Working together	1	2	3	4	5	DK
Making a difference	1	2	3	4	5	DK
Asking questions and exploring	1	2	3	4	5	DK
Being creative and unique	1	2	3	4	5	DK
Hearing advice from girl role models	1	2	3	4	5	DK
Learning about the girls' studies	1	2	3	4	5	DK
Making mistakes	1	2	3	4	5	DK
Motivating others	1	2	3	4	5	DK
Using STEM to solve community problems	1	2	3	4	5	DK
Working with a mentor	1	2	3	4	5	DK
Involving your family members	1	2	3	4	5	DK
Communicating your findings	1	2	3	4	5	DK

Has your child shown interest in any of the following since participating in the SciGirls in Space program? 1=no interest, 5=great interest, or DK for don't know

NASA	1	2	3	4	5	DK
Learning about other girls	1	2	3	4	5	DK
Finding a mentor	1	2	3	4	5	DK
See more SciGirls episodes	1	2	3	4	5	DK
Doing more science activities	1	2	3	4	5	DK
Find a science challenge	1	2	3	4	5	DK

Would you recommend *SciGirls in Space* to another family? YES NO Maybe

What would you say to them about the *SciGirls in Space* program?

Other comments or suggestions

SciGirls in Space Youth Survey Summer 2022

Your teacher's name _____

Where did you do the *SciGirls in Space* program? _____

Why did you sign up for *SciGirls in Space*?

Overall, how much did you like it? (circle one)

Not at all 1 2 3 4 5 A lot

What did you like best?

What did you learn about space science?

What space science topics do you want to know more about?

Did you feel you were able to relate to the girls in videos?

Yes No Some

Why or why not? Please explain.

Did seeing the girls give you ideas for things you could do in your own life?

Yes No

If yes, what were some of those ideas?

Did the women in the short videos you watched inspire you to think about a career at NASA or in STEM?

Yes No

Rate yourself BEFORE and AFTER doing SciGirls in Space the following skills on a scale of 1-10

Before		After
	Working together	
	Making a difference	
	Asking questions and exploring	
	Being creative and unique	
	Making mistakes	
	Motivating others	
	Using STEM to solve community problems	

For the skill you learned the most about from the list above, please explain how you got better.

Would you recommend SciGirls in Space to another student?

Yes No Maybe

What would you say to them?

Other comments or suggestions?

Tell us about you:

How old are you? _____

Please check one or more boxes to describe your racial identity

- African American/Black
- Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, other Asian
- Native American Indian or Alaskan Native
- Native Hawaiian or Pacific Islander
- White
- Other: please describe _____

Do you identify as Hispanic, Latino, or Spanish? Yes No

What is your current gender identity? (Circle all that apply)

- | | | |
|-------------------------------|-------------------------------------|--|
| <input type="checkbox"/> Girl | <input type="checkbox"/> Trans Girl | <input type="checkbox"/> Gender non-conforming |
| <input type="checkbox"/> Boy | <input type="checkbox"/> Trans Boy | <input type="checkbox"/> Different Identity |

If you chose "different identity" please describe here

Before this SciGirls in Space program, had you ever seen any *SciGirls* television shows or videos before?

- | | | |
|------------------------------|-----------------------------|---|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Can't remember |
|------------------------------|-----------------------------|---|

Thank you for taking the time to tell us about your *SciGirls in Space* experience.