



Sparking Girl Scouts' Interest in STEM

A How-to-Guide for Volunteers, Councils, and Supportive Adults

Made possible by



Table of Contents

<u>About this Playbook</u>	3
<u>Why STEM and Girl Scouts?</u>	4
<u>Engaging Girl Scouts in STEM</u>	5
<u>Barriers to Engagement</u>	5
<u>Building a STEM Mindset</u>	6
<u>Career Exploration</u>	8
<u>The Importance of Role Models and Supportive Adults</u>	10
<u>Building STEM Pathways for Girl Scouts</u>	11
<u>Girl Scouts' National STEM Program</u>	12
<u>Connecting STEM and the Girl Scout Leadership Experience</u>	14
<u>Creating Unique Experiences</u>	16
<u>Increasing Access and Belonging for All Girl Scouts</u>	17
<u>Utilizing Local Partners and STEM Networks</u>	20
<u>Resource Directory</u>	21
<u>Overall STEM and Career Exploration</u>	21
<u>Computer Science, Creative Technology, and Digital Leadership</u>	23
<u>Engineering, Rocketry, and Robotics</u>	26
<u>Outdoor STEM, Space Science, and Climate Change</u>	29
<u>Government Resources</u>	31
<u>Bibliography</u>	32

About This Playbook

Girl Scouts of the USA's (GSUSA) vision for Science, Technology, Engineering, and Math (STEM) is for Girl Scouts of all ages to use STEM to make the world a better place. Starting with the Electrician badge in 1916, Girl Scouts has provided hands-on STEM activities that blend technical skills with the Girl Scout Leadership Experience (GSLE) for more than a century.

With over 100 STEM badges and experiences available, Girl Scout STEM programming is about more than preparing future engineers; it's about Girl Scouts discovering how they'll make their mark on the world. Whether they want to protect the environment or build an app that saves lives, STEM helps them to explore their passions and aim for the stars. It considers problems they care about and equips them to take part in building the solutions. We offer STEM experiences that are age-appropriate and progressive to develop and maintain Girl Scouts' STEM interest and STEM identity. STEM identity is when someone either decides they like STEM, feels confident in their STEM abilities, and can see themselves in a STEM career—or does not.

Whether you're a council staff member, volunteer, partner, or caregiver, this booklet is for you! It's been developed for any adults who support Girl Scouts of all grade levels to engage in STEM. We hope it helps you learn about STEM and how it can be a set of tools to help make a difference. As you explore ways to engage your Girl Scouts in STEM, consider what challenges your Girl Scouts may face in accessing STEM education and opportunities and how you can support them to take the lead and follow their interests. The Resource Directory is a great starting place to dive deeper into different areas of STEM with topical information, examples of careers, Girl Scout programs, and other opportunities to grow Girl Scouts' interest and skills. Along the way, there are also stories of Girl Scouts and Girl Scout councils to inspire you and your Girl Scouts' journey through STEM.

Intended Audience: This booklet is made for council staff members, volunteers, partners, caregivers, and adults who support Girl Scouts of all grade levels to engage in STEM.

Made Possible by General Motors, a STEM Pillar Sponsor.

Acronyms Included in this Guide

GS AZ: Girl Scout Activity Zone

GSLE: Girl Scout Leadership Experience

GSRI: Girl Scout Research Institute

GSUSA: Girl Scouts of the USA

STEM: Science, Technology, Engineering, and Math

S&E: Science and Engineering

Girl Scout Grade Levels

Kindergarten and Grade 1: Daisy

Grades 2 and 3: Brownie

Grades 4 and 5: Junior

Grades 6 through 8: Cadette

Grades 9 and 10: Senior

Grades 11 and 12: Ambassador

Not a Girl Scout?

Learn more and get started [here](#).

Important note: Links to third-party websites are provided for convenience only. Girl Scouts of the USA (GSUSA) does not endorse or support the content of third-party links and is not responsible for the content or accuracy, availability, or privacy/security practices of other websites, and/or services or goods that may be linked to or advertised on such third-party websites. By clicking on a third-party link, you will leave the current GSUSA site whereby policies of such third-party link may differ from those of GSUSA.

Why STEM and Girl Scouts?

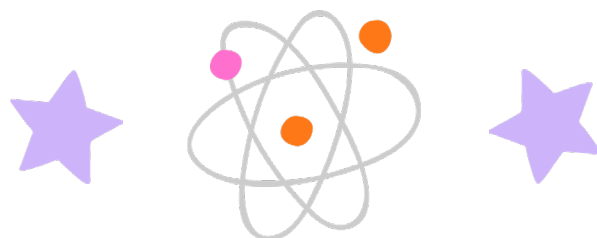
Our world faces massive threats, such as natural disasters, poverty, and cyber warfare. These problems impact individuals, communities, and nations, with inequities seen in access to and engagement in sectors such as healthcare and education and in safety and risk based on differences in power and privilege. Many of these challenges disproportionately affect women and girls. When examined through an intersectional lens, connecting with other factors like race, ability, education level, or socioeconomic background, the impacts become even greater as can be seen in differences in maternal mortality and healthcare, employment and pay gaps, and the impact of biased technology on everything from social media ads to college applications.

STEM provides a set of tools to understand, design, and build our world. What's more, there is almost no job that will be unaffected by technology in the coming decades.¹ This has created a workforce-wide need for both technical skills and social and emotional abilities²—we need to know how to code, but also how to tailor what we create for those we are trying to help. Unfortunately, women and girls have historically been left out of the solution-building process, with women comprising half of our workforce but occupying only 27% of STEM jobs, with the greatest disparities occurring in engineering and computer science.³

Not only are these issues to help solve, but also problems Girl Scouts care about. Women and girls need to engage with STEM to be a part of designing and building our world, and we know they want to do this! The Girl Scout Research Institute's (GSRI) [A New Decade of Girls' Leadership](#) report found that nearly one in two girls are interested in leading advocacy efforts in support of causes or issues they care about. Among those who want to lead, girls care most about the environment and equality and human rights issues or causes.

Girl Scouts provides members with the skills and knowledge to create change and make the world a better place with STEM. STEM inspires an understanding of how nature and the world work and how it can be used to drive exploration and discovery. It teaches digital literacy, critical thinking, and problem-solving. STEM challenges us to consider how technology can be a vehicle for change and how it impacts other areas of our lives, such as culture, the economy, and the environment. Most importantly, STEM expands Girl Scouts' identities as users, shapers, and creators, providing them with skills and empowering them to contribute to the world. STEM helps grow the confidence, ambition, and creativity they need to address community problems. It also provides transferrable skills for careers, entrepreneurship, personal health, and finances⁴.

Without STEM opportunities, women and girls will be further left behind. The skills gap and digital divide will continue to increase, impacting the health and livelihood of not just those who are excluded, but also their children, communities, and future generations. Furthermore, increasing women's participation has the power to close the gender pay gap and boost women's cumulative earnings globally⁵.



Engaging Girl Scouts in STEM

Though children do not differ in their potential science and math abilities, they do differ in their interest, confidence, and sense of belonging in STEM. We know that girls and young women are interested in STEM and participate in STEM courses at high rates yet report less interest in pursuing STEM careers than young men.⁶ What's more, this disparity only increases as girls age into higher education and careers.⁷ This lack of interest and confidence stems from a variety of factors that leave girls unable to see themselves represented within STEM education and practice spaces.

Explore More

Check out the [“State of Girls and Women in STEM”](#) from the National Girls Collaborative Project for more statistics and research.



Barriers to Engagement

Social and environmental factors deter girls' engagement in STEM and formation of their STEM identity. What's more, once girls begin to lean away from STEM activities, it is very difficult to reengage their interest.

Four of the major barriers to women and girls forming their STEM identity include:¹⁰

- **Gender stereotypes:** Children often learn the perception that “STEM is for boys, not for girls.” For example, when children were asked to draw a scientist, about half of girls drew a woman, compared to 5% of boys. However, as girls grow up, studies have found they're more likely to draw a male scientist, showing the persistence of this misconception into adulthood.⁸
- **Math anxiety:** In school, girls' achievement in math and science is on par with that of boys, with larger gaps existing between students of different racial and ethnic backgrounds and family incomes.⁹ However, teachers often expect more of them than boys, passing math anxiety on to their female students.¹⁰
- **Dominant culture:** Much of our world centers around the leadership and viewpoints of men (particularly white men). For example, when a team of programmers is made up of mostly men, it shows computer science as being something only for a select group—it can even skew the work, as seen through things such as algorithmic bias online. Including women in STEM spaces brings new leaders, ideas, and perspectives.
- **Representation:** Popular media and the world generally show more examples of white, cisgender men in STEM than of women and other people across lines of difference. Role models and mentors that are relatable to girls can inspire their interest and help them see that there is a space for them in STEM. Check out “The Importance of Role Models and Supportive Adults” for more information on page 10.

Building a STEM Mindset

From the layout of a city to a new solution to food insecurity, STEM is a set of tools to build and understand our world. It's also a problem-solving process—you start with a question, find evidence, build and test your idea, analyze it, and share your work with others. It can be used to build a skyscraper or a battery. It can help us understand bugs and the human body. It can help us find new cures for diseases and keep our personal information safe.

To engage with STEM, girls must become interested, experience success, and come to value the role STEM plays in our society. They must see that STEM is grounded in real-life experiences and that it intersects with issues they care about. They need access to hands-on experiences, early and throughout their school years, with the space to try new things and fail. And with support from family and role models, girls can continue to build their confidence and sense of belonging in STEM today and into their futures.



Ideas to Build Girl Scouts' STEM Mindsets

- **Show how STEM is all around us:** Engage Girl Scouts in hands-on activities that show how STEM is already part of their everyday lives and interests. For example, if they like the outdoors, STEM helps us understand the life cycle of a butterfly. If they love video games, those were developed by people with careers in STEM!
- **Highlight how STEM can make a difference:** Support Girl Scouts to discover how they can use STEM to make a difference and help solve issues they care about. Whether they want to help the environment or their community, grounding the skills they learn in real-world situations can boost their interest and engagement.
- **Embrace failure:** Seeing failure as a good thing can help build Girl Scouts' confidence in STEM. Whether working on a math equation or a design challenge, show them that failure is part of the process—when you find out what doesn't work, that's information to help make your work even better.
- **Defy stereotypes:** Build Girl Scouts' STEM confidence regardless of what activity they are doing. For example, keep it girl-led and let your Girl Scouts lead a troop meeting for a STEM badge they're interested in. Bring in STEM experts across lines of difference. Show examples of women, girls, and others in STEM (check out the [IF/THEN® Collection](#) for ideas!) who are changing the world to build their sense of belonging.
- **Make it a collaborative process:** When Girl Scouts work together, they build skills like teamwork and communication. They investigate, find answers, and give feedback, just like a real team of scientists or engineers. Encourage Girl Scouts to work in pairs, small groups, or even all together as one group.



Explore More

Check out these [ten engineering practices](#) from the [Million Girls Moonshot](#), such as using a design process, considering real-world problems, applying math and science, and working in teams.

Career Exploration

A Girl Scout's pathway into STEM can begin at home, extend from kindergarten through grade 12, and even grow into a future in higher education or a STEM career. And though we often think of STEM careers as traditional jobs like doctor, engineer, and scientist, STEM intersects in all different roles and fields.

What's more, our future needs people across lines of difference with both technical and social-emotional skills to build a better world for all. And whether Girl Scouts choose to pursue a STEM career or not, becoming a scientifically literate person is crucial to live in our world and can help them make a difference.

What do Girl Scouts and girls think of STEM and STEM careers?

When thinking about careers in technology, girls are most interested in app development, robotics, web design, coding, and programming. However, one-third of girls are unfamiliar with STEM skills and fields such as engineering, coding, cybersecurity, and artificial intelligence.¹⁵



Ideas to Support Girl Scouts in Exploring STEM Careers

- **Connect their interests with careers:** Support Girl Scouts to explore how their interests today can become a future career. Do they like puzzles and computers? Explore cybersecurity! Interested in inventing and helping the planet? Check out environmental engineering.
- **Discover the possibilities:** When Girl Scouts find a field or job that interests them, help them research the skills, education requirements, local opportunities, needed training, and any other considerations, such as relocating and what that may entail.
- **Build a STEM network:** Help Girl Scouts connect with STEM professionals and opportunities to continue learning about topics they're interested in. Check out "Utilizing Local Partners and STEM Networks" on page 20 for more ideas.
- **Sharpen their skills:** Support Girl Scouts to intern, volunteer, or job shadow. Help them find a class, workshop, or online course. Encourage them to join a club at school or a group in their community.
- **Learn more with Girl Scouts:** Check out the [Award and Badge Explorer](#) and the [Girl Scout Activity Zone](#) to find Girl Scout programs and activities in many different STEM fields, from mechanical engineering to computer science.



Did You Know?



While most girls' STEM interest decreases with age, Girl Scouts' STEM interest actually increases from age eight. And though there is a slight drop in tech career interest from middle school to high school, the drop is not as significant as it is for non-Girl Scouts, suggesting that Girl Scout involvement promotes interest, perhaps through STEM exposure and skill development, during these years.¹⁵

The Importance of Role Models and Supportive Adults

When a Girl Scout does STEM, we want them to say, “I can see myself doing this today and tomorrow.” Showing them that there are others like them in STEM can make all the difference in building a Girl Scout’s STEM identity. Role models across lines of difference help break down stereotypes, showing Girl Scouts that whether building a robot or going to the moon, they can do it!

Supportive adults can express care, expand Girl Scouts’ possibility thinking, and provide them with a safe and inclusive environment. Troop leaders, volunteers, service units, and councils guide Girl Scouts through STEM badges, awards, and experiences at troop meetings, events, camps, and more. Businesses and other organizations can provide Girl Scouts with technical support, expertise, and opportunities—imagine having an outdoor gear designer or a zoologist at a troop meeting! At home, parents and caregivers can support Girl Scouts to pursue their interests and dreams.

Adults can show Girl Scouts that STEM is everywhere and that anyone (regardless of their gender) can do STEM, from learning about the science behind bubbles in the sink to what kinds of native plants can be found in the area. They can make sure to treat all kids equally when it comes to technology and allow them the space to try new things, experiment, and learn from failure. When Girl Scouts show interest in a topic, adults can support them to learn more,

whether by watching a nature documentary together or finding a robotics camp. And whenever Girl Scouts have questions, adults can help them find answers—online, at the library, through their community, or anywhere else. Many adults who work with Girl Scouts are not STEM



Did You Know?

Parents and caregivers who have a positive outlook on technology are more likely to have daughters who are digital leaders, and girls who are digital leaders show enhanced interest in STEM.¹⁵

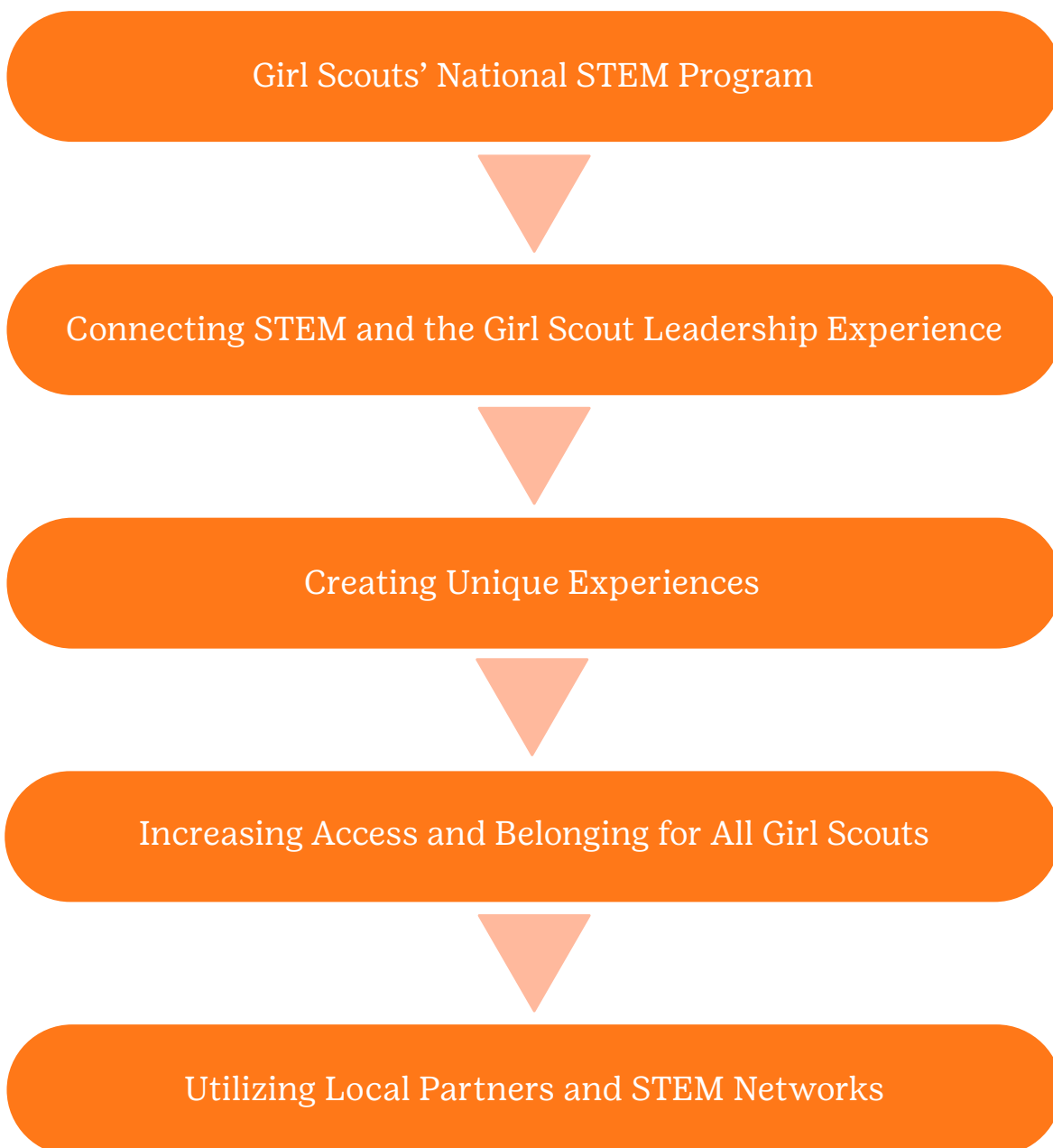
experts, and that’s okay—our program is designed for a non-expert. There are also many resources to help, such as those in this booklet and through the local council. A Girl Scout’s network of friends and family, council staff, local organizations, and even businesses can also be invaluable support. And even if they aren’t a STEM expert themselves, an adult supporting their Girl Scout to find opportunities and explore their STEM interests can help show them that they could have a future in STEM.

Explore More

- **From Girl Scouts:** Check out the [Girl Scout Family Connection](#) and [Raising Awesome Girls](#) for straightforward, realistic, and proven advice to support your Girl Scout.
- **On Role Models and Mentors:** The National Girls’ Collaborative Project (NGCP) has curated [this listing](#) of role model and mentoring resources. The [Million Girls Moonshot](#) offers articles, resources, toolkits, and videos related to family engagement, role models, and mentors. [Techbridge Girls](#) offers resources and opportunities for out-of-school time educators and STEM professionals.

Building STEM Pathways for Girl Scouts

While STEM skills and knowledge are built over time, STEM interest can be sparked at any age. But how does a Girl Scout go from doing STEM as part of a troop meeting to choosing a STEM career in the future? And what can you do to support them? This section explores these questions and more with ideas to help bring Girl Scout STEM programming to life for your Girl Scouts.



Girl Scouts' National STEM Program

At all ages, Girl Scouts can explore STEM in a hands-on, no-pressure environment through progressive, age-appropriate, and fun activities that spark their interest. Girl Scouts discover how STEM connects with things they already love and use STEM to help solve problems big and small. They try new things, make friends, and build skills. Supported by adults that encourage them to take the lead, Girl Scouts have the girl-centered space to gain confidence, form an unshakeable STEM identity, and experience success in STEM.



What do we know about Girl Scouts' STEM program?

A [2022 study](#) from GSRI found:

- 1. We're successfully engaging Girl Scouts in STEM.** Two-thirds of Girl Scouts (67%) are doing STEM programs—and the majority are doing multiple activities.
- 2. Doing just one STEM activity through Girl Scouts makes a difference!** For Girl Scouts of all ages, doing 1+ STEM activity during the troop year resulted in higher levels of STEM interest, confidence, and rating of value to society at the end of the year compared to Girl Scouts who did no STEM activities.
- 3. We're connecting Girl Scouts to a variety of STEM experiences.** Girl Scouts' STEM experiences covered topics from computer science to engineering, outdoor STEM, and more, including events and trips alongside STEM national programs.
- 4. Girl Scouts find our STEM programs fun and educational!** Fun and hands-on activities are important for youth to become engaged with STEM, and more than nine in ten Girl Scouts had fun doing STEM with Girl Scouts.
- 5. The Girl Scout STEM experience is cumulative.** Compared to Girl Scouts who do not engage in our STEM program, Girl Scouts who engage in STEM activities become interested in taking more STEM classes and having a career in STEM. Additionally, the more frequently Girl Scouts do activities through our STEM program, the more likely they are to be interested in future STEM education.

Did You Know?



STEM is everywhere! Our program connects STEM with all different areas of life, from enjoying the outdoors to entrepreneurship. No matter what Girl Scouts are interested in, try to find the STEM connection. A love for video games might make a budding game designer! A passion for art or building might lead to a career that focuses on making, like an engineer or architect. Whether you're at a troop meeting or attending an event focused on the outdoors, encourage your Girl Scouts to find the connection between their interests, STEM, and the world around all of us.

Girl Scouts' STEM Program

For Girl Scouts and non-members

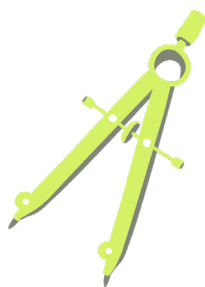
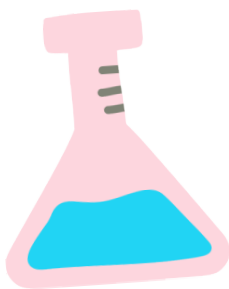
Girl Scout Activity Zone (GSAZ): Curated for kids and teens, this website provides a sampling of Girl Scout activities and videos. The [Girl Scout STEM activities page](#) includes self-guided STEM-specific activities that can be done at home, with a troop, or anywhere else!

Council and National Events: Events can spark STEM interest, often within the context of a STEM badge or patch. Youth learn new skills and see STEM in action as they meet new role models and friends. Search for events through [GSUSA](#) and your [local council](#).

Challenges: With Girl Scout challenges in topics such as climate change and the outdoors, youth can get a taste of Girl Scouts as they complete a set number of activities in the given topic. Find GSUSA's current challenges on the [GSAZ](#).

Community Service and Take Action: Youth can use STEM to make a difference. Community service projects make the world a better place right now, while Take Action—also called service learning—addresses the root of an issue and creates a lasting effect. Some Girl Scout programs have these already built in, but youth can also take part in [National Service Projects](#).

Not a Girl Scout? Learn more and get started [here](#).



Only for Girl Scouts

Awards and Badges: The National Program Portfolio provides Girl Scouts with foundational skills, building their confidence and competence in topics from robotics to math to nature. Find out more about each program on the [Award and Badge Explorer](#).

Experiences: Experiences like workshops, interest groups, and camps deepen Girl Scouts' STEM interest and skills while connecting them with experts and like-minded peers. Find experiences at your [local council](#) and the [Girl Scout Camp Finder](#).

Destinations: Girl Scout Destinations are the ultimate adventure for Cadettes, Seniors, and Ambassadors. With STEM adventures spanning ocean exploration to biomedical engineering, individual Girl Scouts can apply to travel with other Girl Scouts from all over.

Highest Awards: Girl Scouts in grades 4–12 can connect STEM with community problem-solving as part of their Highest Award projects. Girl Scouts can use their STEM knowledge to make a difference, furthering their identity and path as a STEM leader, as they earn their Bronze, Silver, or Gold Award.

What are Girl Scouts doing at each level?

Badges are the most utilized STEM program. However, older Girl Scouts are less likely to do badges, participate in the Cookie Program, or do STEM. In contrast, as Girl Scouts grow older, they tend to do more Community Service, Outdoor, and Camping activities.

Connecting STEM and the Girl Scout Leadership Experience

Girl Scouts' STEM program encourages our members to engage in STEM, become scientifically literate, and have the option to explore STEM careers. All as part of the [Girl Scout Leadership Experience](#) (GSLE), Girl Scouts look at our world and take action to change it for the better. Our evidence-based model provides the structure, support, and human connection necessary for Girl Scouts to develop their leadership potential. Learn more about the GSLE through Girl Scout STEM stories!

What Girl Scouts Do

Discover: Girl Scouts find out who they are, what they care about, and how to best use their unique talents.

Connect: Girl Scouts collaborate with others, both locally and globally, to learn and expand their horizons.

Take Action: They do what Girl Scouts always do: make the world a better place.

“Girls CAN Do” is a yearly event at Girl Scouts of Northeastern New York that connects community service, food insecurity, and STEM. With support from partners, Girl Scout teams first conduct food drives for non-perishable canned foods. Then they use their creativity, problem-solving, and engineering skills to design and build a structure around a theme from carnival to “I Love NY” with awards for Structural Ingenuity, Innovative Construction, Best Use of Labels, and Best Meal Representation. After the event, the food is boxed and donated to local food pantries—teams donated over four tons of food in 2023.

How They Do It

Girl-Led: From selecting badges to organizing an activity, Girl Scouts take the lead, follow their dreams, and grow their skills—and gain the confidence that comes with doing these things.

Learning by Doing: Hands-on activities help Girl Scouts feel empowered to shape their own experience. They unlock their “I’ve got this” attitude.

Cooperative Learning: Teamwork, friendship, and collaboration help fuel Girl Scouts through any challenge that comes their way.

Two Girl Scout Ambassadors, Anna and Kyoko, took Girl Scouts of Eastern Washington and Northern Idaho’s Space Scouts astronomy club to moonshot status by launching a second club for younger Girl Scouts! The club became wildly popular, gathering together for space science badge events, International Observe the Moon nights, rocket launches, field trips to a planetarium and observatory, and guest speaker presentations. The two leaders also connected with local amateur astronomers who could help build their technical knowledge of sky viewing. Going above and beyond, the Space Scouts used their love of STEM and astronomy to recruit new Girl Scouts to join their council, bringing telescopes to Girl Scout summer camps in their area to inspire others to join in the fun and be inspired by the possibilities! They even met an astronaut at a local event. To build the club’s future, they’re also entrepreneurs who make T-shirts and patches to show off their love for space science. These STEM-inspired Girl Scouts know that astronomy is cool—when you shoot for the moon, you will at least reach the stars!

Who They Do It With

With the guidance of **supportive adults** and **troop leaders** who help bring these three unique processes to life through a variety of activities, Girl Scouts try new things and see how good it feels to lead from the heart.

“In our annual survey, Girl Scouts are asked if they were in charge of STEM, what would they do? A Daisy said, ‘We would fly to space.’ I have this printed on my desk. It reminds me to always think outside of the box and find inspiring and engaging programming. Maybe one day I can get them to space (or at least close!)”

—Program Staff at Girl Scouts of Orange County

How They Benefit: Our Outcomes

The formula is simple, but the impact is huge. An accepting environment + supportive adults + a variety of fun and hands-on STEM experiences = Girl Scouts who see the value of STEM and who have the interest, confidence, and competence to take the lead! And because all STEM programming integrates the GSLE, Girl Scouts develop both the technical and socio-emotional skills to make the world a better place, today and in the future.

GSLE Outcomes

- **Strong Sense of Self:** Have confidence in themselves and their abilities, and form positive identities.
- **Positive Values:** Act ethically, honestly, and responsibly, and show concern for others.
- **Challenge Seeking:** Take appropriate risks, try things even if they might fail, and learn from mistakes.
- **Healthy Relationships:** Develop and maintain healthy relationships by communicating their feelings directly and resolving conflicts constructively.
- **Community Problem-Solving:** Desire to contribute to the world in purposeful and meaningful ways, learn how to identify problems in the community, and create “action plans” to solve them.

STEM Outcomes

- **STEM Interest:** Identify STEM subjects as something they like, want to learn more about, and want to pursue further.
- **STEM Confidence:** Feel that they have the skills and abilities to successfully engage in STEM.
- **STEM Competence:** Have learned the intended skills and/or content knowledge of the program.
- **Value of STEM:** Believe that STEM knowledge and pursuits are important and relevant to real life, and that these can be used to address personal and/or societal problems.

“We put on a ‘Robotics Badge Bash’ for Brownies and Juniors with our local chapter of the Society of Women Engineers. The best part came at the end, when to my and many of the adults’ surprise, many Girl Scouts remarked that their favorite part of the event was when their robots failed. They loved getting to problem solve and figure out what went wrong. One of the biggest obstacles to getting them excited about STEM education is the mindset that failure is a negative thing. We often see failure lead to discouragement, and as a result, a lack of interest. It was so exciting to see them embrace failure as a part of the learning process and even celebrate it! I know that the environment we created is what allowed them to explore STEM in a fearless way.”

—Girl Scouts of California’s Central Coast

Creating Unique Experiences

Girl Scouts' STEM program includes low-cost, low-resource activities that a non-expert can facilitate so all Girl Scouts can participate. However, what Girl Scouts do can be adjusted to fit a variety of factors, from education and ability to available resources and expertise.

As you begin planning a new STEM experience, it can help you to consider:

- **Program:** What topics are your Girl Scouts interested in? Is there a national or local program that relates? What activities will you do? How can you amplify the experience?
- **People:** Who will be facilitating? How can you make it girl-led? Can your network support your Girl Scouts' efforts? Would it be helpful or inspiring to bring in experts?
- **Place:** Will you be at a troop meeting, event, virtual, or somewhere else? Can you utilize any council spaces, such as an office, service unit center, camp, or mobile unit?
- **Materials:** What materials will you need? What could add more variety? Can your Girl Scouts help gather the materials? If needed, do you have equipment and Wi-Fi?
- **The Story:** Can you take photos, film videos, or collect stories about Girl Scouts' experiences? How can you share the story with Girl Scouts, their families, and the local council?

There are so many ways to amplify what Girl Scouts do. For example, you might include:

- **Experts:** STEM professionals and anyone with expertise in a topic can help facilitate or be a great role model for Girl Scouts. You might have them share their experience, show their workplace, or do activities with Girl Scouts.
- **Events and Field Trips:** A trip to a park, museum, or even a coffee shop can show Girl Scouts that STEM is all around. Search online, through Girl Scouts, or through your network for opportunities that connect to your Girl Scouts' interests.
- **Related experiences:** What Girl Scouts learn through a badge or event can be built on with deeper experiences, such as travel, camp, workshops, or interest groups.
- **Community Service, Take Action, and Highest Awards:** Girl Scouts can connect any topic with community service and Take Action. Junior Girl Scouts and above can also use STEM to support a **Highest Awards** project.



Did You Know?

GSUSA and your local council may have partners that can support your Girl Scouts with expertise, materials, space, experiences, and more. Check out “Utilizing Local Partners and STEM Networks” on page 20 and the “Resource Directory” beginning on page 21 for more information and ideas.

Increasing Access and Belonging for All Girl Scouts

Women and girls are often disproportionately impacted by global problems and left out from the solutions-building process, especially when examined through an intersectional lens. Intersectionality considers how one’s identities, such as class, race, sexual orientation, and gender, do not exist separately, but are complexly interwoven and together create the way someone experiences the world.

When considered through an intersectional lens, access to STEM and technology varies widely by Girl Scout and girl. For example, youth in both urban and rural areas may face underfunded schools and insufficient access to transit, resulting in missed opportunities for STEM learning at every age. When looking at college and career, the total number of science and engineering (S&E) degrees earned by women has increased, but disparities exist between racial and ethnic groups, with white Americans having earned more bachelor, master, and doctoral degrees in S&E than all marginalized groups combined.¹¹

We all have a role to play in creating the just and equitable world that everyone deserves. Girl Scouts aims to provide all girls with the resources and support they need to raise their voices and change their corner of the world. We must amplify the voices and experiences of those who are among the most marginalized by society—including people of color, LGBTQIA+ people, accessibility community, and others who, because of our country’s pervasive systemic inequities and people’s related biases, haven’t enjoyed the same access, exposure, and freedoms of those with more socially advantaged identities (e.g., white, straight, cisgender).

Together, we can work to ensure that all Girl Scouts can access meaningful, culturally responsive STEM programming. We can take actions like providing role models across lines of difference and meeting our members where they are—in their neighborhoods, schools, and community centers. We can let Girl Scouts share their experiences, shine through their strengths, and take the lead in what they do. We can create a space of mutual respect and belonging for all Girl Scouts by treating them and ourselves with dignity, honoring differences, and supporting them through experiences that are applicable, innovative, and meaningful to them.

Explore More

The National Girls’ Collaborative Project (NGCP) has curated lists for [Exemplary Practices: Access and Equity](#) and [Resources for Underserved Youth](#). [Techbridge Girls](#) also offers gender responsive, culturally relevant curriculum and equity training.



On Girls' Digital Access

GSRI's 2019 report, "[Decoding the Digital Girl](#)" found:

- **Access to smartphones is consistent for all girls**, but girls in lower-income households are less likely to have laptops and other technology.
- **Girls with limited tech access at home are two times more likely to be missing out on valuable digital learning experiences**, such as doing homework, researching, and reading. They also score lower for being able to find reliable information, connect with community, and create digital content.
- **Girls in lower-income households and in rural areas tend to be less familiar with various tech skills**, including robotics, web design, engineering, coding, and artificial intelligence. They are also less likely to be interested in STEM or tech careers.



Ideas to Increase Access and Belonging in STEM

- **Keep it girl-led:** Listen to your Girl Scouts and allow them the space to share their experiences and strengths. Connect their interests to real-world examples of STEM that are relatable to them. As they learn and try new things, remind them of the importance of collaboration and that it's okay to fail.
- **Know your audience:** Everyone has varying preferences for how they like to communicate, learn, and be addressed. You can help build Girl Scouts' sense of belonging by using their personal pronouns and adapting your activities for all abilities. When talking about something like technology, avoid generalizing what "everyone" thinks or does when that may not apply to all individuals.
- **Include diverse examples:** Whether you're bringing in an expert or searching for examples of STEM professionals, prioritize elevating the experiences of people across lines of difference, such as women of color, women with a disability, women who are low-income and working-class, and LGBTQIA+ people. Role models that are relatable to Girl Scouts can break stereotypes and help any Girl Scout say, "I see myself doing this."
- **Use inclusive language:** Avoid language that promotes a gender binary or stereotype, such as assuming that a doctor or scientist is a man. Emphasize agency and strengths and not limitations to describe something like cultural barriers to STEM interest or success. Be mindful of terms, such as "white hat" and "black hat" to describe hacking, that are outdated when considering factors like race and ethnicity.
- **Think locally and globally:** Girl Scouts have varying access to experiences with people across lines of difference. Encourage them to connect their communities, from local to global to online, and STEM interests through programs like [World Thinking Day](#), the [Global Action Award](#), and [multicultural community celebration patches](#). Support them to use STEM to solve community problems through community service, [National Service Projects](#), Take Action, and [Highest Awards](#).
- **Understand ableism:** Ableism is discrimination against people with physical, intellectual, or psychiatric disabilities. To accommodate Girl Scouts of all abilities, learn how ableism can affect how we view the world, understand your Girl Scouts' need, and adapt what you do. For example, avoid jargon, acronyms, and complex phrasing, and use a mix of speaking, visuals, and hands-on activities.
- **Avoid saviorism:** Saviorism—including white saviorism—is when people who identify significantly with the dominant culture (e.g., able-bodied, white, straight, male, college educated, cisgender) attempt to "rescue" or "bring hope to" people who are further outside the dominant culture.²¹ Encourage Girl Scouts to work with their community for projects like community service and Take Action. When creating for others, have them find out what's most important to those they are trying to help (don't assume!).

STEM in Action

Girl Scouts of Central Texas offers their program, "Tech Girls," in partnership with local Title 1 high schools near Austin, a very tech-centered city. Through the program, youth gain hands-on STEM experiences, a bond of sisterhood, and leadership skills that help give them the confidence to succeed. Learn more about the program [here](#).

Utilizing Local Partners and STEM Networks

Whether you're a council staff member or a volunteer, community partnerships can be beneficial for any aspect of Girl Scouting—including STEM. Your local STEM network includes all the people, groups, and organizations from your community that can help engage Girl Scouts in STEM programming.

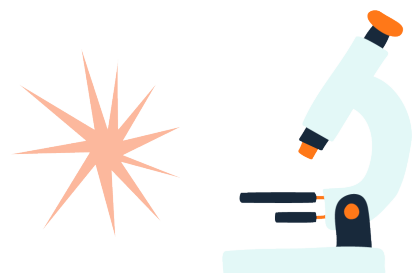
Close to home, Girl Scouts' families and friends can help with anything from gathering materials or volunteering for troop meetings to providing connections and expertise in STEM. At the local level, your Girl Scout Council might have partners, funders, and individuals who work in STEM. There may be local schools and educational institutions as well as STEM-related businesses and companies in your area that would love to get involved with Girl Scouts. You might even find other nonprofits, youth development organizations, and community spaces and centers, such as museums, science centers, and libraries, that can offer STEM programming. At the national level, GSUSA also has partners to support you, like the Society of Women Engineers.

Partnerships of all sizes connect your Girl Scouts with the local community in a concrete way. Your STEM network may be able to provide expertise in specific STEM topics to fill gaps or to evolve the experience for Girl Scouts. For example, a partner might have content experts or volunteers to help facilitate badges such as cybersecurity or robotics. They might have spaces or equipment, such as a computer lab or makerspace, to support program delivery. They might offer STEM experiences or events, such as workshops and field trips. Partnerships at every level can increase community awareness of both the importance of STEM and what Girl Scouts do. These partnerships can also create new opportunities that advance STEM for Girl Scouts and other youth in your community.

Check out the “Resource Directory” starting on page 21 for information on Girl Scouts' national STEM partnerships and other organizations that support girls in STEM.

Ideas to Build Partnerships

- **Map your STEM network:** Make a list of anyone who might already be part of your STEM network and what they offer: expertise, space, equipment, or something else? Add others you think could help. Then make a plan for whom you'd like to build or strengthen your relationship with. Pick a few goals if you're just starting.
- **Tap into existing networks:** Council partners may be able to help your council, service unit, or troop with STEM. There may also be an existing network of local STEM partners, such as an [National Girls Collaborative Project \(NGCP\)](#), that you or your council is (or can be) connected with.
- **Keep it girl-led:** Build a network around your Girl Scouts' interests. Consider what's most exciting and educational for them (or ask!), such as partnering with a local nonprofit for a creative coding workshop or with a park ranger who can share more about their career.
- **Think outside the box:** STEM is everywhere, and partners are, too! STEM partners can be anywhere—Girl Scouts could explore the science of baking at a bakery or learn about automotive engineering at a car dealership.
- **Be patient:** STEM networks are ever evolving, and partnerships can take time to build. Test new ideas and try out different kinds of partnerships to find what works best for you and your Girl Scouts.



Resource Directory

Overall STEM and Career Exploration

What will buildings and towns look like in the future? What kinds of technology will exist? Will people unite around issues like global warming or limited resources? Whatever the future holds, a career with STEM can help shape the world for the better!

Every day, more and more careers are utilizing STEM to help people, protect the environment, and design our world. What's more, not every job is what you might think of as a "STEM career." For example, you might do marketing for a nonprofit focused on an environmental issue like clean water or analyze data for any kind of business. These kinds of jobs use STEM skills in all different areas.

Research from GSRI



- [**A New Decade of Girls' Leadership \(2020\)**](#): This report examines how girls define, experience, and aspire toward leadership in their current and future lives.
- [**Girl Scout Alums by the Numbers \(2020\)**](#): With more than 50 million Girl Scout alums, Girl Scouts are making a difference as elected leaders, entrepreneurs, astronauts, and more!
- [**The Girl Scout Alum Difference \(2021\)**](#): This study assesses how participation in Girl Scouts is linked to later life success among adult alums and women who earned their Girl Scout Gold Award.

Did You Know?

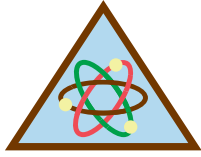


- Women make up about half of the current U.S. workforce but hold only 27% of 10.8 million potential STEM jobs.³
- The gender gap varies greatly by STEM field—for example, women make up the majority of social scientists and health-related careers, close to half of math as well as life and physical science careers, but only about one in four engineering and computer science careers, which include the majority (80%) of STEM careers.³
- Girl Scout alums are more likely than non-alums to be civically engaged and make a difference in their communities by being leaders.¹²

Girl Scout Program Spotlight: STEM Career Exploration Badges



Daisy STEM Career Exploration



Brownie STEM Career Exploration



Junior STEM Career Exploration



Cadette STEM Career Exploration



Senior STEM Career Exploration



Ambassador STEM Career Exploration

With a badge for each level, Girl Scouts of all ages explore their interests, how they want to make a difference, and how STEM can be a tool to help. They look at how to change the world with STEM and consider their own next steps toward a STEM career. Find these badges and others on the [Award and Badge Explorer](#).

You might also...

- Find STEM connections in any Girl Scout program, from life skills to travel.
- Use STEM as part of a community service, Take Action, or Highest Awards project.
- Go on a field trip, find an event, or invite a guest speaker to bring expertise and real-life experiences to your STEM activities.

Keep the Fun Going

- **Discover STEM careers with the [IF/THEN® Collection](#):** The IF/THEN® Collection is a digital library of relatable photos, videos, and other assets that represent women in STEM careers as diverse as shark tagging, fashion design, and training Olympic athletes.
- **Request role models through [Science Cheerleaders](#):** Science Cheerleaders include 300+ NFL, NBA, and college cheerleaders who work in STEM, challenging stereotypes with the goal of inspiring girls to see the possibilities that are available.
- **Search for events through [Connected Girls](#):** This free, curated directory contains STEAM opportunities and events that are designed for girls or other groups that have been historically excluded as well as professional development opportunities for adults related to gender equity and STEM.
- **Find resources from the [Million Girls Moonshot](#):** Million Girls Moonshot share webinars, professional development opportunities, and more to support girls' engagement in STEM.

Next Stop: The Sky!

At Girl Scouts of Missouri Heartland, the Sky badge led a Girl Scout named Sierra toward a passion and a future career as a pilot. While working on her Sky badge, Sierra received an invitation to fly with a local aviation chapter! It was Sierra's first ever time in the sky, but she had no fear. Once Sierra landed, she wanted to jump at the next possible chance to fly. Now the teen is working toward obtaining her pilot's license with a long-term goal to fly jets for the United States Air Force. Not many women fly aircraft in the Air Force, and Sierra wants to change that..

If she wasn't a Girl Scout, Sierra doesn't believe she would have discovered her passion for flying. Through Girl Scouts, Sierra has been able to try new experiences and take part in opportunities that most teens don't normally have access to in their day-to-day lives. Sierra's troop leader and her project to achieve her Sky badge paved the way to the skies. We celebrate Girl Scouts like Sierra, who go boldly into the future and show us what girl-led can become.

Resource Directory

Computer Science, Creative Technology, and Digital Leadership

Coding and computer software can be used to help solve problems and design things: from a robot, app, website, or video game to animations for a movie or TV show. Computer science is the study of computers, the internet, and how they're used. Creative technology combines art, design, and computer science to create things that are both useful and fun, from an app or a building to sound effects or a new pair of sneakers.

With technology, our ability to find information and connect with others is easier than ever, but also riskier. Cybersecurity focuses on keeping devices and their data safe. Digital leaders improve their own lives and the world through their digital experiences and use of technology in helpful and creative ways.



Did You Know?



- With 30,000 websites hacked daily and a new cyberattack every 39 seconds, cybersecurity is one of the top risks for companies and individuals, with both women and children more likely than men to fall victim.¹³
- Women make up 27% of computer science occupations, including 3% Black or African-American women, 7% Asian women, and 2% Hispanic or Latina women.¹⁴
- Girl Scouts are more likely to be digital leaders than boys and non-Girl Scout girls. They're also more likely than non-Girl Scouts to be interested in technology careers.¹⁵

Careers to Make a Difference

- **Keep data and networks safe:** Cryptographers write code to encrypt sensitive data, keeping it safe from hackers and providing privacy for people, organizations, and businesses.
- **Make with technology:** Industrial designers develop physical products like toys and shoes, while visual designers create logos, brochures, ads, websites, and more.
- **Analyze “big data”:** Bioinformatics scientists use computer programs to collect and analyze data, such as gene sequences, to help humans, animals, and plants.

Research from GSRI

- [Decoding the Digital Girl \(2019\)](#): This report examines how girls use technology and exhibit leadership in the digital space.
- [Breaking the Firewall to Girls’ Cybersecurity Access \(2020\)](#): This paper explores women’s representation in cybersecurity with research and insight from experts.



Explore More

- **Learn more about the gender gap in computing:** This [report from NCWIT](#) includes studies on the importance of supportive adults and tips to increase girls’ engagement in computing.
- **Discover careers in cybersecurity from [Cyber.org](#):** Find out about cybersecurity careers from a cyber forensics expert to a cyber legal advisor.

Girl Scout Program Spotlight: Digital Leadership Badge



Daisy Digital Leadership



Brownie Digital Leadership



Junior Digital Leadership



Cadette Digital Leadership



Senior Digital Leadership



Ambassador Digital Leadership

With a badge for each level, Girl Scouts of all ages consider how they use technology and how to empower themselves and others. They learn digital literacy basics, such as not sharing personal information, and digital wellness skills, such as how to respond to bullying. They also create digital products to raise awareness about a topic they care about. Find these badges and others on the [Award and Badge Explorer](#).

You might also...

- Try a badge or program that connects technology to other areas, such as entrepreneurship, making, or life skills.
- Use [codeSpark Academy](#) (for K-5) or [Vidcode](#) (for Grades 6-12) for the Coding for Good badges.
- Watch the [Cyber Safety Video Series](#) from the Cybersecurity and Infrastructure Security Agency (CISA) and Cyber.org to highlight how Girl Scouts can stay safe from several common online threats.

Keep the Fun Going

- **Try activities from [Code.org](#)**[®]: These computer science activities and resources are available for K-12 youth and educators.
- **Examine cybersecurity with [Cyber.org](#)**: With activities like the [Keys to Cybersecurity](#) and [Test the Strength of Your Passwords](#), youth can build their cyber skills.
- **Join clubs and more from [Girls Who Code](#)**: Girls Who Code offers coding clubs and other programs for grades 3 and up.
- **Connect with [Hack Club](#)**: High schoolers can join Hack Clubs and hackathons to build open-source projects online and in person with peers.
- **Explore AI through [International Society for Technology in Education \(ISTE\)](#)**: These guides include background information and projects to explore what AI is, how it works, and how it impacts society.
- **Find educational resources from [Women in Cyber Security \(WiCyS\)](#)**: Explore a future in cybersecurity, including higher education ideas, scholarships, and more.
- **Discover resources from [NCWIT](#)**: NCWIT offers ways to engage girls in computing experiences that align with their interests and passions, inspire them with real-life role models, celebrate their persistence, and more.

Resource Directory

Engineering, Rocketry, and Robotics

Engineers design and build our world. They create bridges, cars, roads, and other products. They have jobs in every kind of field, helping build solutions big and small. For example, they might design prosthetics for the medical field, agricultural systems to grow more food, or cleaner energy systems that are less harmful to the environment.

There are four major types of engineering—chemical, mechanical, electrical, and civil—and specialized fields, such as agricultural engineering (developing automated machinery for efficient seeding, irrigation, and harvesting of crops), marine engineering (designing naval ships from smaller sailboats to ocean liners), and entertainment engineering (creating interactive museum exhibits and theme parks).

Careers to Make a Difference

- **Build our world:** Civil engineers design infrastructure such as bridges, water systems, and roads. Mechanical engineers create all types of machines, from batteries to airplanes to refrigerators.
- **Power our world:** Electrical engineers design machines that use electricity, such as personal electronics, electric motors, surveillance systems, and electrical systems for vehicles and aircraft.
- **Invent our world:** Chemical engineers design new foods, medicines, and materials in fields such as chemistry, physics, and biology.

Research from GSRI

Today's Girls, Tomorrow's Entrepreneurs (2019):

Engineering and entrepreneurship are often connected, even using the same problem-solving process, called the design thinking process, to create new products and businesses. This study explores the skills girls need now to be the entrepreneurs of the future and how their experiences and attitudes affect their career goals.

Explore More

Find out about different [pathways in engineering](#) from the Society of Women Engineers (SWE).

Did You Know?



- Some of the fastest-growing fields of engineering include biomedical engineering, environmental engineering, and civil engineering.¹⁶
- Women hold only 15% of engineering occupations, but this number varies greatly by specialization—9% of mechanical engineers are women compared to 35% of environmental engineers.¹⁷
- Women of color make up less than 12% of engineers (1.8% Black women, 6.5% Asian women, and 2.4% Hispanic and Latina women).¹⁸

Girl Scout Program Spotlight: Robotics Badges



Daisy Design a Robot



Brownie Designing Robots



Junior Designing Robots



Cadette Designing Robots



Senior Designing Robots



Ambassador Designing Robots

With three badges for each level, Girl Scouts of all ages design and build robots to solve problems. They also explore robotics competitions and how to share their work with others. Find these badges and others on the [Award and Badge Explorer](#).

You might also...

- Try a badge or program that uses engineering and building in different areas, such as entrepreneurship or life skills.
- [Learn about rocketry](#). Older Girl Scouts can also build teams to compete in the [American Rocketry Challenge](#).
- Use the design thinking process (how engineers solve problems) to help create a Take Action or Highest Awards project.

Keep the Fun Going

- **Robotics with [FIRST®](#):** FIRST® offers K–12 robotics programs, including [FIRST® LEGO® League](#) for pre-K to grade 8, [FIRST® Robotics](#) for high school, and [FIRST® Tech Challenge](#) for grades 7–12.
- **Robotics with the [REC Foundation](#):** Girl Scouts can participate in VEX robotics programs with competitions and challenges for elementary school through college.
- **Explore STEM with [General Motors](#):** Build a lemon battery, measure air quality, design a car, and more with these videos featuring STEM, vehicles, and engineering.
- **Discover Aviation with [United Airlines](#):** Explore aviation, aerodynamics, careers, and more with lesson kits for Kindergarten through grade 8.
- **Engineer with the [Society of Women Engineers \(SWE\)](#):** Girl Scouts ages 13+ can become part of [SWENext](#).

“One of our main engineering challenges is to engineer something that can help someone or solve a community problem. It is awe-inspiring to see the creativity when the girls work together to create something that could make a difference in someone’s life. Girls have selected challenges from helping someone with a disability to creating a more environmentally friendly way of life. At an event that brought together girls from different backgrounds, one girl was discussing a problem in her neighborhood that other girls had never experienced. They listened to the girl and felt moved to work together on this problem rather than work on their own problems. They asked to work together and were full to the brim of ideas. This example shows that through STEM they were able to work together in a meaningful way.”

—Staff from Girl Scouts in the Heart of Pennsylvania

Resource Directory

Outdoor STEM, Space Science, and Climate Change

From the deep ocean to high mountain tops, our global ecosystem contains millions of species of animals, plants, and other organisms that work together to shape nature and our environment. Beyond Earth, our solar system alone contains multitudes of discoveries still to be made.

Unfortunately, our world faces a changing climate caused by our use of fossil fuels. It's resulted in extreme weather that's destroying nature and our communities with women and girls uniquely impacted. To prevent more damage, we must reduce the amount of carbon pollution—we can help by planting and protecting trees, using STEM to build solutions for Earth and beyond, and spreading awareness in our communities.

Careers to Make a Difference

- **Study Earth and climate:** Meteorologists and climatologists predict weather and learn how it affects the Earth and people. They use data from satellites, maps, and the atmosphere to predict weather patterns and study climate change.
- **Care for animals:** Wildlife rehabilitators rescue and treat wild animals that are hurt. They care for them until they are healthy enough to be released back into the wild.
- **Protect nature:** Conservation scientists are experts on how best to use land without hurting the soil and water. They work at parks and forests to help communities have enough water, minerals, trees, and other resources for today and tomorrow.

Research from GSRI

Girl Scouts Soar in the Outdoors (2019): Outdoor STEM creates solutions to big problems like pollution and erosion, but being outdoors benefits us as individuals, too. This report examines the benefits of participating in the Girl Scout national outdoor program.

Save the Date!

Each second weekend in September, Girl Scouts, their families, and friends enjoy local natural resources during Girl Scouts Love State Parks. Explore a trail, meet a wildlife rescuer, sleep under the stars, or have a picnic with friends—there are over 500 events happening across the country! Find out more at girlscouts.org/stateparks.

Did You Know?



- Driven by human activity, nearly one million plant and animal species are on the brink of extinction.¹⁹
- Women hold 45% of careers in life and physical sciences.³
- 94% of Girl Scouts think that the Girl Scouts organization should focus on protecting the environment.²⁰

Girl Scout Program Spotlight: Space Science Badges



Space Science Explorer



Space Science Adventurer



Space Science Investigator



Space Science Researcher



Space Science Expert



Space Science Master

With a unique badge for each level, the Space Science badges help Girl Scouts of all ages explore different parts of space science, from the planets in the solar system to how light works. Find these badges and others on the [Award and Badge Explorer](#).

You might also...

- Try a badge that relates to nature or the outdoors, or complete a challenge like the [Girl Scouts Love the Outdoors Challenge](#) or the [Girl Scout Climate Challenge](#).
- Find a citizen science project through [SciStarter](#) for Girl Scouts to collect data, such as the number of squirrels or trees in their area, and help professional scientists with their research while completing Girl Scout programs at the same time.
- Use American Forest's [Tree Equity Score](#) to measure and map tree cover as part of the [Girl Scout Tree Promise](#) or anything with trees.

Keep the Fun Going

- **Explore green careers, trees, and more from [American Forests](#):** American Forests offers [careers resources](#), a [career exploration guide](#), and a [curriculum](#) for high school around green careers and urban forestry.
- **Plant trees through the [Arbor Day Foundation](#):** Purchase trees or have them planted in honor of loved ones to support the [Girl Scout Tree Promise](#).
- **Learn about citizen science with [SciStarter](#):** This training helps citizen scientists brush up on the basics, sharpen their skills, and find facilitation tips and tools.
- **Discover space science with the [SETI Institute](#):** The SETI Institute offers curriculum and other programs to explore space sciences and astrobiology.

“At Camp Ken-Jockety, we produce maple syrup. We view this as a STEM program, from the chemistry and food science to even physics. This year, we equipped Girl Scouts with drills and got them involved in the tapping process, showcasing how they can utilize the land around them for food production, and diving into the chemistry of how you take a raw, natural product and develop it into a final product. We also provided Girl Scouts with the materials to collect sap and continue learning independently and with their families.”

—Staff from Girl Scouts of Ohio's Heartland

Resource Directory

Government Resources

Understanding how the government works can help Girl Scouts see the important roles they can play in their community. What's more, there are so many different agencies and careers that focus on STEM areas spanning from cybersecurity to the environment.

Check out the federal agencies below for topical information, resources, events, and more to support Girl Scouts' engagement in STEM, now and in the future!

- **Bureau of Land Management (BLM):** BLM focuses on the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations. Their [programs for children](#) provide opportunities for families to spend time outdoors and inspire the next generation of conservation stewards.
- **Cybersecurity & Infrastructure Security Agency (CISA):** CISA leads federal cybersecurity efforts and coordinates infrastructure security, offering [resources](#) for K-12 education.
- **National Aeronautics and Space Administration (NASA):** NASA is America's civil space program. Their [STEM site](#) offers activities, information, and opportunities for youth and adult facilitators.
- **National Oceanic and Atmospheric Administration (NOAA):** NOAA studies everything from the surface of the sun to the depths of the ocean floor. Find [educational resources](#), [resource collections](#), [hands-on activities](#), and opportunities and events for [K-12](#). Search for [resources on weather](#) and [JetStream](#) (an online weather school) from the National Weather Service. [Find meteorologists](#) to meet with your Girl Scouts, join a [citizen science project](#), or use data to solve environmental issues with [Data in the Classroom](#). Explore [activities around climate](#), [play games](#), and more.
- **U.S. Coast Guard:** The Coast Guard works at sea to protect national security. Kids can learn more about boats and airplanes with the [Official Coast Guard Coloring Book](#), and older Girl Scouts can find [career and educational opportunities](#).
- **U.S. Environmental Protection Agency (EPA):** Working to protect human health and the environment, the EPA offers K-12 resources such as the [Watershed Academy](#), [environmental education](#), and [more](#) about the environment.
- **U.S. Fish and Wildlife Service (FWS):** FWS works to conserve, protect, and enhance fish, wildlife, plants, and their habitats. Their [education programs](#) connect families and people of all ages to the outdoors and provide job opportunities for young people.

Don't forget state and local government!

From learning about the importance of cybersecurity at your mayor's office to hiking through your state park, there may be opportunities, events, and more to support and grow Girl Scouts' interest in STEM.

Bibliography

1. Muro, Mark, Robert Maxim, Jacob Whiton, and Ian Hathaway. 2019. [*Automation and Artificial Intelligence: How machines are affecting people and places.*](#) The Brookings Institute.
2. World Economic Forum. 2023. [*The Future of Jobs Report 2023.*](#)
3. Martinez, Anthony, and Cheridan Christnacht. 2021. [*Women Are Nearly Half of U.S. Workforce but Only 27% of STEM Workers.*](#) United States Census Bureau.
4. United Nations Children’s Fund, ITU. 2020. “Towards an equal future: Reimagining girls’ education through STEM.” New York.
5. Council on Foreign Relations. 2017. [*Girls’ STEM Education Can Drive Economic Growth.*](#) June 16.
6. Student Research Foundation. 2023. [*STEM Research.*](#)
7. National Girls Collaborative Project. 2023. [*State of Girls and Women in STEM.*](#) February 23.
8. Yong, Ed. 2018. [*“What We Learn From 50 Years of Kids Drawing Scientists.”*](#) The Atlantic, March 20.
9. National Science Board, National Science Foundation. 2022. [*“Elementary and Secondary STEM Education.”*](#) Science & Engineering Indicators.
10. AAUW. n.d. [*The STEM Gap: Women and Girls in Science, Technology, Engineering and Mathematics.*](#)
11. National Center for Science and Engineering Statistics, National Science Foundation. 2021. [*“Women, Minorities, and Persons with Disabilities in Science and Engineering.”*](#)
12. Girl Scout Research Institute. 2020. [*Girl Scout Alums Take Action!*](#) Girl Scouts of the USA.
13. Vardham, Raj. 2023. [*“How Many Cyber Attacks Happen Per Day in 2023?”*](#) Techjury.
14. NCWIT. 2022. [*“By the Numbers.”*](#) NCWIT.
15. Girl Scout Research Institute. 2019. [*Decoding the Digital Girl.*](#) Girl Scouts of the USA.
16. McDowell, Evan. 2021. [*The 6 Fastest Growing Engineering Industries of 2021.*](#) May 1. Austin Nichols Technical Search.
17. Society of Women Engineers. 2023. [*Employment.*](#)
18. Catalyst. 2022. [*Women in Science, Technology, Engineering, and Mathematics \(STEM\) \(Quick Take\).*](#) August 23.
19. Daigle, Katy, and Julia Janicki. 2022. [*“Extinction crisis puts 1 million species on the brink.”*](#) Reuters, December 23.
20. Girl Scout Research Institute. 2021. Girl Scout Voices Count Survey. Girl Scouts of the USA.
21. RESULTS, nd. [*Learning about Power, Privilege and Oppression.*](#)



Made Possible by General Motors, a STEM Pillar Sponsor.

TM[®] & © 2023 Girl Scouts of the United States of America. All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, electronic or mechanical methods, including photocopying, recording, or by any information storage or retrieval system, now known or hereinafter invented, without the prior written permission of Girl Scouts of the United States of America (GSUSA), except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law. For permissions requests, visit the www.girlscouts.org website to access permission request forms.