

Helping Girls Become STEM Superstars

Do you know a girl who's interested in STEM? The answer is yes!

If a girl loves listening to music...playing sports...cooking...playing video games...dancing...making jewelry...geocaching...costume design...or stargazing...she's interested in STEM.

If she wants to cure diseases...explore space...create new fashions...discover ancient ruins...care for animals...invent new toys...edit videos...or dive into the ocean depths...she's interested in STEM.

And most elementary school-aged girls already have the right mindset for STEM:

- ▶ **Girls are curious and like to ask questions.**
- ▶ **They enjoy talking about ideas and making things with others.**
- ▶ **They love to use their imaginations.**

For many girls, however, their interest in STEM subjects fades away as they move through middle school and high school. We can help keep their passions and curiosity for STEM subjects alive by:

- ▶ **Showing them how STEM subjects can help others.** Research shows girls are more interested in STEM careers after they've learned how the work in those fields helps people have better lives. →

▶ The teen characters on the Netflix show *Project Mc²* solve spy missions and everyday problems with their special skills.



STEM Women Take Action!

Real-life women scientists are doing things like:

- ▶ using math to find out what causes poverty and how to solve it.
- ▶ using technology and science to protect wildlife.
- ▶ building websites and designing apps to give a voice to young people who live in remote and poor areas around the world.
- ▶ studying the brain to find cures for Alzheimer's and autism.

You don't need to know everything about science or have all the answers to help girls. Explore, learn and observe together. Your enthusiasm and encouragement will give girls the STEM spark they need.

- ▶ **Helping them see that they do belong.** Research shows that simply changing science-related posters in computer labs from boy-oriented images to gender-neutral images can help girls feel more engaged.
- ▶ **Encouraging them and giving girls an equal playing field.** Research shows that young girls' brains are just as capable as boys' brains when it comes to learning about STEM. However, some teachers, guidance counselors, friends or family still give girls the message that STEM is not for them.

With some help and guidance, more girls will pursue STEM studies after high school and more women will be represented in STEM careers. If we can inspire young girls to stick with these subjects, we can help keep them on the path to things like...

- ▶ Exciting opportunities to make a difference in the world — and have some adventures along the way!
- ▶ Jobs that pay 33% more than non-STEM jobs.
- ▶ More career options — STEM jobs will increase by 17% in the next two years.

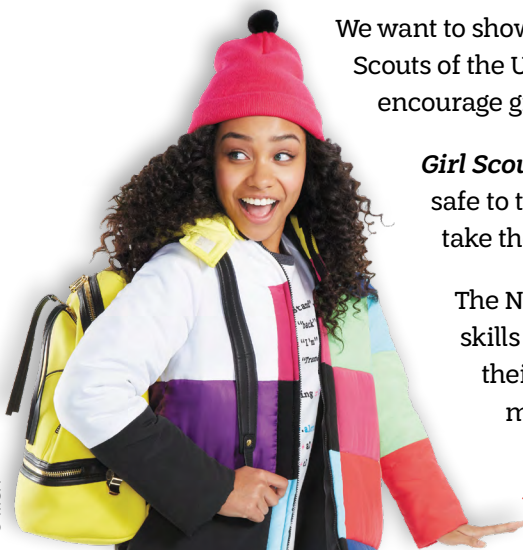
Girls Belong in STEM

“Generation STEM,” a study by the Girl Scout Research Institute (GSRI) found that 73% of girls are interested in STEM-related fields. The study also points out:

- ▶ Girls and boys perform equally well in math and science: In high school, girls' grade point averages aggregated across math and science classes are higher than boys.
- ▶ Girls interested in STEM have higher academic achievement and interest in all school subjects.
- ▶ Like many scientists, girls thrive working in groups and collaborating with others to solve problems.
- ▶ Girls engaged in STEM are more confident when it comes to taking on challenges about stereotypes and their future.

So, how do we make all of this possible? With your help.

You can help girls make the connection between STEM and their own interests and passions.



We want to show our girls just how exciting, fun and attainable STEM can be. So Girl Scouts of the USA created this booklet, sponsored by Netflix, with tips about how to encourage girls to *explore and enjoy STEM*.

Girl Scouts offers fun, hands-on STEM activities; an all-girl environment where it's safe to try to new things; and a focus on how girls can use what they've learned to take the lead and make the world a better place.

The Netflix original series **Project Mc²** empowers girls to celebrate their special skills and interests. The main characters are undercover teen spies who use their smarts — from culinary chemistry to gadget engineering — to solve missions and save the world. Along the way, the girls prove that smart is the new cool.

← Bryden Bandweth on *Project Mc²* is a digital diva when it comes to all things tech.

Figure out what you enjoy, what your talents are, and what you're most curious to learn about.

— Lisa Randall, Harvard physics professor and author of popular science books

**Read on to find out
how you can
empower the next
generation of
female scientists! →**

3 Ways to Make STEM Matter for Girls

1 SHOW 2 CONNECT 3 ENCOURAGE

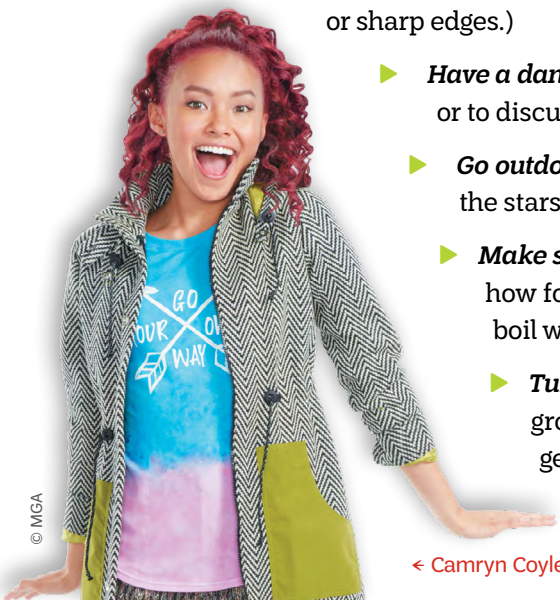
1 Show girls how STEM subjects are woven throughout their everyday lives and what they care about.

- ▶ **Watch the news!** Once you start watching for cool science news stories — whether online, in newspapers and magazines or on TV — you’ll see them everywhere. Talk about these stories with girls to make them even more curious about STEM. [see box: Cool Science News]
- ▶ **Play “I Spy...Science”!** Ask girls to point out objects and name their connection to science. For example, a lamp uses electricity, cars are powered by engines, bridges need to be engineered to hold up cars, and so on.
- ▶ **Take things apart!** Have household items to take to the recycling bin? Hold on to a few, such as clocks or toys, and help girls take them apart to see how they work. (Don't use objects that contain toxic substances. Take safety precautions when using objects that include glass or sharp edges.)

As Thomas Edison once said about his early efforts to invent the light bulb, “I have not failed. I’ve just found 10,000 ways that won’t work.” Kids need experiences where they can try and fail, over and over again, without fear of a bad grade and without losing faith in their ability to succeed.

—Esther Dyson and Lucy N. Friedman
“Why STEM classes won’t help solve the serious STEM achievement gap,” *The Washington Post*

- ▶ **Have a dance party!** Ask girls to identify the muscles used in each dance move, or to discuss how the music is transmitted from a player to the speakers.
- ▶ **Go outdoors!** Observe nature—plants, insects, animals, clouds, weather, and the stars. Talk about the people who study nature as part of their jobs.
- ▶ **Make something to eat!** Ask girls to help measure ingredients. Observe how food changes when it’s cooked. Talk about the water cycle as you boil water.
- ▶ **Turn “errand time” into “math time”!** Challenge girls to add up the cost of groceries as they’re added to the cart. Ask them to count the change you get back when you buy something. →



◀ Camryn Coyle on *Project Mc²* can turn ordinary objects into cool machines.

3 Ways to Make STEM Matter for Girls continued

2 Connect girls to STEM role models, both in real-life and in pop culture.

- ▶ Watch movies and TV shows with female STEM superstars or smart and savvy teens, like *Project Mc²*'s group of undercover spies.
 - ★ **McKeyla McAlister** is a natural leader who uses smarts, friendship, and teamwork to save the world.
 - ★ **Adrienne Attoms** is a culinary whiz who whips up recipes for success using chemistry in the kitchen.
 - ★ **Bryden Bandweth** is a tech genius and social media guru who can code her way out of any conundrum.
 - ★ **Camryn Coyle** enjoys construction and tinkering, and is an engineering extraordinaire.
 - ★ **Devon D'Marco** is an edgy artist who knows life is a blank canvas and paint is her solution.
 - ★ **Ember Evergreen** enjoys earth science and uses her green thumb as an agent-in-training.
- ▶ Watch documentaries about STEM subjects, like *Planet Earth*, *Wildest Islands*, or *Underwater Dreams*, about low-income teens who win a robotics competition.
- ▶ Check out books and comics with strong STEM role models.
- ▶ Talk to girls about women scientists, engineers or mathematicians, like *Project Mc²* star Danica McKellar, who is a real-life mathematician.
- ▶ Help girls meet female STEM role models in person. You may know someone who would inspire girls — perhaps a neighbor who works at a hospital, a co-worker whose job focuses on technology or math, a high school student who won a science fair or a college student who's majoring in organic chemistry. Arrange a time when she can talk to girls and answer their questions.

- ▶ Tour places in your community where people work in STEM jobs. For example, take girls to a botanical garden, power plant, hospital, reservoir, state or national park, zoo, weather station, recycling center, planetarium, aquarium or engineering firm. →

← McKeyla McAlister on *Project Mc²* uses leadership and problem-solving skills to carry out impossible missions.

Cool Science News

Capture girls' imaginations by sharing the exciting, innovative, weird, and sometimes funny work that scientists do.

New Creature Discovered On Ocean Floor

A team of scientists and technicians scanning the rocky ocean floor spotted a bright-purple, googly-eyed squid. The creature could be a new species.

School Bus Takes Kids On Virtual Tour Across Mars

As the bus moves, it makes students feel like they're driving across the red planet by showing 200 square miles of its surface on the boarded-up windows.

Snooze Watching TV? Smart Socks to the Rescue!

Netflix developed a pair of socks that have an accelerometer that detects when you've stopped moving for a period of time, and pauses the show.

Pulling Water from the Air

In rural Ethiopia, women and children walk up to six hours to collect water. So an industrial designer created the Warka Water, an inexpensive structure that extracts gallons of fresh water from the air.



Being "scientific" involves being curious, observing, asking how things happen and learning how to find the answers.

— From "Help Your Child Learn Science," The U.S. Department of Education

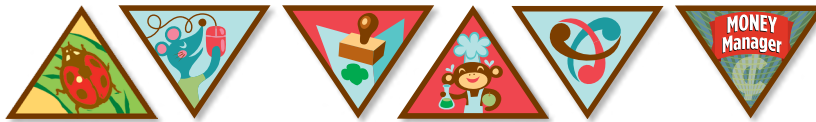
3 Ways to Make STEM Matter for Girls continued

3 Encourage girls to participate in STEM events and activities.

In Girl Scouts, girls can “learn by doing” through hands-on activities. Research shows that this is an effective way to get children engaged and interested in STEM.

Girl Scouts of the USA has several national STEM programs for girls in grades K – 5:

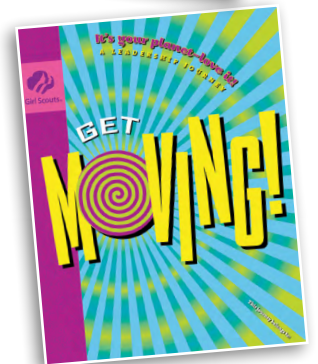
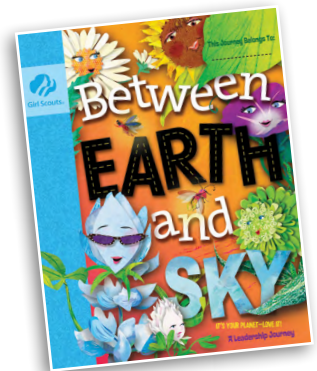
- ★ **Daisies** (grades K – 1) learn about animals, plants and the outdoors when they do the *Between Earth and Sky* program.
- ★ **Brownies** (grades 2 – 3) learn about saving and protecting water through the *WOW! Wonders of Water* program. They also build STEM skills by earning badges such as Bugs, Computer Expert, Letterboxer, Home Scientist, Inventor, and Money Manager.



- ★ **Juniors** (grades 4 – 5) learn about energy through the *Get Moving* program. Their STEM badges include Digital Photographer, Detective, Entertainment Technology, Animal Habitats, Flowers, Product Designer, and Geocacher.



- ★ Girls of all ages learn key math skills (and earn badges) by taking part in the Girl Scout Cookie Program.



Girl Scouts also make a difference in their world by doing Take Action projects. Research shows that girls are more interested in STEM careers when they make the connection between STEM and helping others. Here are ways you can help them do that:

- ▶ **Discuss issues girls care about** – from taking care of animals to feeding the hungry – that are being addressed with STEM.
- ▶ **Share news stories about female STEM leaders** who have helped people or made a difference.
- ▶ **Talk about how all scientists** – engineers, software developers, health care providers, manufacturers, researchers, or even undercover spies, like the girls in *Project Mc²* – can help people make the world a better place. →

3 Ways to Make STEM Matter for Girls continued

- ▶ **Help girls find ways to serve the community in a way that matters to them.** This might mean planting a butterfly garden, putting on a school skit about saving water, or making a presentation to the school board about how the school can save energy.
- ▶ **Consider doing a “citizen science” project.** Citizen science invites non-scientists to collect data to help scientists with their research. For example, girls might count birds or butterflies in their area, use a kit to test water quality or take photos of the air. Check out scistarter.com for citizen projects that girls can do.
- ▶ **Contact your Girl Scout council to find out about the STEM opportunities offered on a local level.** Councils often offer one-day STEM events, workshops and camp programs. Many councils support a number of robotics teams, offer STEM field trips and have partnerships with local science museums, planetariums, aquariums, and universities.

Science “happens” all around us every day. When you least expect it, a moment for learning will occur: A bit of ice cream drops on the sidewalk and ants appear; some cups float and some sink when you’re washing dishes; static electricity makes your hair stand on end when you put on a sweater.

— From “Help Your Child Learn Science,” The U.S. Department of Education

◀ **Adrienne Atoms on Project Mc² whips up fun chemistry in the kitchen.**



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