girl scouts
diamonds of
arkansas, oklahoma
and texas

STEM BADGE TRAINING GUIDEBOOK

DBJ Coding Basics badge

DEAR GIRL SCOUT COLLEAGUES,

Here are a few notes and resources to use for this workshop with volunteers. We want every volunteer to benefit from the council's volunteer trainings offered. Once she has done that, however, she may want more guidance in specific areas, such as leading STEM badges and journeys.

Council staff and service unit volunteers are key facilitators to use this workshop as another resource in our growing "toolbox," filled with tools to meet the needs of our wonderful volunteers. It is not mandatory, but we hope it is helpful as you tailor the guidance you provide to meet the needs of volunteers.

OVERVIEW

This training will cover crucial information on Girl Scout STEM programing and outcomes, especially the Daisy, Brownie and Junior Coding Basics badge. We will cover why Girl Scouts engage in STEM programs and how they do it – in girl-led, cooperative learning environments where they learn by doing. Girl Scouting introduces girls of all ages to STEAM activities that help develop their creativity and hone their critical thinking skills. By doing STEM badges with your troop, leaders are directly contributing to girls' growth to STEM interest, confidence, competence and value, and preparing them to make the world a better place. This training was designed to help volunteers:

- Understand the Three Processes in STEM badges and journeys and how they benefit girls
- Transfer what they've learned about the STEM program and the Coding Basics badge to other STEM badges and journeys
- Become more confident in leading girls through STEM activities

Prime candidates for this session include:

- Daisy, Brownie and Junior troop leaders
- Adults new to using the Three Processes with girls
- Volunteers feeling apprehensive about their STEM experiences and being able to lead girls through badges and journeys
- Adults who learn best in a face-to-face setting with enthusiastic facilitators

PREPARATION

1. Suggested: watch the webinar version of this training, can be found _____
2. Gather materials for the chosen badge activity: Brownie Coding Basics activity 3 – Create Algorithms for a Computer that Follow a Sequence
3. Set up the room with tables that seat four or five people, or set up tables and chairs in a horseshoe shape. Try to avoid auditorium seating.
4. Use a PowerPoint slide or print important training information, such as the meeting agenda and survey

FACILITATOR'S NOTES
SESSION DESIGN

TIME	STEPS	MATERIALS
	Volunteers will **sign-in** to the training session on a physical sign-in sheet or on a Word or Excel document. Have them include their name and email address.	Sign-in sheet or laptop

TIME	STEPS	MATERIALS
0:00-0:05 (5 minutes)	**Introduce** yourself and your co-facilitator (if applicable) and welcome participants. Let them know that during the next 90 minutes, they'll take part in fun activities that will help them prepare to confidently lead their troop(s) in doing STEM badges and journeys.	

0:05-0:15 (10 minutes)	**PART I: Why STEM?**
	• Exploring new topics can pique girls' interest in a broader range of topics while developing their thinking skills, such as design thinking and problem solving. Badges will help them build skills that will benefit them in any career field, whether it be in business, art, science, teaching, etc.
	• STEM programs address society's most pressing needs through hands-on learning in computer programming, mechanical engineering, cybersecurity, robotics and more.
	
	STEM in Girl Scouts
	• The Girl Scout Leadership Experience, or the GSLE, is how we accomplish our mission that girls will lead with courage, confidence and character who make the world a better place. We know from research that when girls achieve the five outcomes of the GSLE, they become responsible, engaged and caring citizens.
	• Girl Scout programs are centered around the four program pillars: STEM, Outdoors, Life Skills and Entrepreneurship.
	• STEM stands for science, technology, engineering and math. The badges, as written, are designed to achieve the four STEM outcomes:
	  1. STEM Interest, girls are excited about STEM subjects and want to learn more about them
	  2. STEM Confidence, girls have confidence in their STEM skills and abilities
	  3. STEM Competence, girls think scientifically to solve problems
	  4. STEM Value, girls understand the importance and relevance of STEM to people and society.
	• In Girl Scouts, girls will understand how STEM helps people and society, connect with role models and caring adults, and have access to resources and support. Girls learn in girl-only environments where it is Okay-to-Fail. They will make connections between badge activities and how they can use
		Badge and journey categories

TIME	STEPS	MATERIALS
	their STEM skills "for good," in a range of potential career options.	
0:15-0:25 (10 minutes)	**STEM Self-Assessment Activity** Take a break to address some concerns the volunteers may be having about leading STEM badges and journeys. Have attendees reflect on their personal experiences with STEM topics growing up and what they thought about science, technology, engineering and math subjects in school or other programs. Use the following questions to prompt discussion: • What makes you excited about leading your girls through STEM activities? • What fears or apprehensions do you have? • What do you think or believe about STEM education, particularly STEM programming in Girl Scouts? Have a group conversation about the prompts and any other concerns the volunteers express at this time. Hear them out and validate them by addressing the amount of time they give to being able to lead in Girl Scouts. **Sample talking points:** • We recognize that as badges and programs continually change, it can be quite a lot for a troop leader to navigate the resources and deliver STEM activities to your girls. • Along with the materials in the Volunteer Tool Kit, we hope that information from this webinar, demonstration videos and badge activity plans from the VTK will help break down everything you need to get your troop dive into STEM with you as their mentor, whether or not you've thought you could be a STEM mentor.	

TIME	STEPS	MATERIALS

0:25-0:30 (5 minutes)	**STEM badges and journeys**
	
	• Leaders may think that their girls aren't interested in STEM or didn't join Girl Scouts to do STEM activities.
	• Think about how you can encourage girls to see STEM as something that "Girl Scouts do," just like outdoor and life skills activities.
	• We know that girls are more interested in STEM when they know they can help others. According to the Girl Scout Research Institute, or GSRI, almost 100 percent of girls surveyed desire to help people and make a difference in the world through their careers. Our programs are designed to leverage this. Girls learn they're not just coding for the fun of it, they're coding for good.
	• Volunteers can model creativity and resilience when trying new things, for example, leading a STEM badge when you don't have experience with the topic it covers. Girls thrive best when they have consistent and caring adults in their lives, and leaders can be that STEM role model they need by doing these badges and journeys with them.
	• Badges
	  o Badges are all about skill building.
	  o STEM badge categories include animals, automotive engineering, coding for good, cybersecurity, digital arts, investigation, mechanical engineering, robotics, science and technology, space science and STEM career exploration.
	  o A lot of STEM badges are progressive, meaning they in a series of three. STEM badges include specific activity instructions and resources so that anyone can teach these concepts, regardless of their personal level of expertise.
	• Journeys
	  o Journeys are all about leadership development, girls discover, connect and take action to make a difference in the world.
	  o Journeys help Girl Scouts build on skills that will help them earn their Bronze, Silver and Gold awards.
	  o The STEM journey categories are engineering, computer science and outdoor STEM.
		Badge and journey categories slide, make sure it is up to date by checking for updates on the badge explorer

0:30-0:50 (20 minutes)	**PART II: Coding Basics badge**	**Daisy, Brownie or Junior Coding Basics badge activity plan**

TIME	STEPS	MATERIALS
	Note: This badge has plugged and unplugged activity options. In this training we will focus mainly on the unplugged version, but if your attendees express interest in the plugged activities, you can show them where to find those instructions on the Volunteer Toolkit within the badge meeting aids. Coding Basics is the first of three Coding for Good badges, in which girls will explore how computer scientists write programs for computers that solve problems. Girl Scouts learn about women in STEM and learn how they can make the world a better place using their coding knowledge! This is a great badge for troops or IRGs, no matter the leaders' level of experience with computers or coding. The badge is designed for leaders to learn alongside their girls – and this is simplified by the adoption of resources available via the VTK. **Activity breakdown** Take some time to review and discuss the badge activities for what they really are: fun activities like coloring, playing leapfrog, creating dance routines and handshakes, and board games. Volunteers may be surprised that none of the activities for the Coding Basics badge require them to explain an actual computer code or sit in front of a computer and input 1's and 0's. **Try it: Coding Basics badge activity** Lead the attendees through at least one of the Coding Basics badge activities, as if they were Girl Scouts and the trainer is the troop leader. Keep in mind the troop level breakdown of your volunteers in the session, it might be more helpful for a room full of Brownie leaders to do a Brownie activity instead of a Daisy activity, but this is flexible. Also, if several attendees have listened to this training webinar, they have already had a chance to do the Patch Quilt Algorithm activity and could benefit from trying another activity. Tell volunteers that during this activity they should be thinking about how the activity is explained to them, what is clear or unclear, and other thoughts about the content and how they complete the steps. This will help them get in the mindset of a Girl Scout going through this same activity and can give leaders more perspective on their girls' experience in their badge workshops.	**IF DOING BROWNIE PATCH QUILT ACTIVITY:** • **Patch Quilt Algorithm handout per attendee** • **Blank Patch Quilt handout per attendee** • **2-3 markers or crayons** • **Whiteboard or chart paper** **Badge activity breakdown (webinar slide table)**

TIME	STEPS	MATERIALS
0:50-1:10 (20 minutes)	**PART III: How STEM?** Now that volunteers have learned more about the STEM badge and journey offerings, and they've tried an activity from the girls' perspective, they will learn best practices and about helpful resources for leading STEM badges. Below are best practices and talking points for each. In leading this discussion, stop and ask the attendees if they have questions or concerns to help break up information. 1. **Be prepared – it's what we do!** Familiarizing yourself with the materials in the Volunteer Toolkit, like the activity plans with talking points, meeting aids and handouts, and glossaries is a great way to prepare for your meetings. Use the talking points, but feel free to make them your own with unique examples and anecdotes. Make sure you are repeatedly using the vocabulary taught in each badge. Each STEM badge includes a glossary, which can be found in the meeting aids in the VTK, and the terms are worked into the dialogue in the activity plans. It's great to help them retain the basics of what they're working on and in realizing how a coloring or cooking activity is actually related to coding and following algorithms. This is true for all STEM badges. Work in those terms several times through examples from the activity plans or from your own experiences! 2. **Use Girl Scouts' Three Processes** We know that when girls' are engaged through these processes, they will achieve the outcomes of a strong sense of self, positive values, challenge seeking, healthy relationships and community problem solving. The processes are already built into the badge activities as they are written, so look for them and notice when you find them. 3. **Show them it's okay to fail!** It's important to help our girls realize that just because they're facing struggles and frustrations with a topic, they should not write off the possibility of great success in what they're initially struggling with.	

TIME	STEPS	MATERIALS
	The way to learn something new is by giving it a try, so it's okay to make mistakes or get confused. However, girls' and women's over-caution and perfectionism is socially ingrained and taught. Our bravery isn't always encouraged. How can we as adults, and most of us adult women, break this cycle? How can we be brave ourselves so our girls can be brave without thinking about it? In meetings, allow girls to struggle a little bit and resist the urge to jump in and help them solve a problem right away. We want our girls to succeed and a big part of this will come from them being able to learn from their mistakes and appreciate them down the road as a part of their learning process. You might ask them questions to help them realize their mistakes and help them think about potential solutions, but for the most part, let them do this by themselves. You'll also want to talk to your co-leaders and troop parents about their role in these badges and in their girls' STEM learning. Mention that it's more beneficial for the girl to be the one putting her problem-solving skills into action, rather than the adult stepping in to correct the issue for her. Girl Scouts is a safe space to try new things, solve problems, make mistakes and try again! Some things you can suggest that leaders or parents say to girls to help them help them are "I believe in you!" "It's ok, keep trying" and "Mistakes and going back to the drawing board are a part of science!" and "Think about how proud of yourself you will be when you get through this!" **4. Encourage girls to persevere** ☺ One of the most important things to remember when talking to your girls about STEM or doing a STEM activity is to encourage them to be brave and persevere. This is a lesson that will build them up for a future of success in whatever field they choose. Perseverance can be demonstrated by not giving up on an activity or instructions that you can't understand at first, second, or even third read. An example of perseverance and bravery is being inspired to help girls challenge themselves, learn something new and gain confidence in themselves by leading them through badges you may know nothing about going in, like in Coding Basics. It's ok	

TIME	STEPS	MATERIALS
	to be honest with your girls about the experience of preparing and leading the badge, it's okay to tell them if it was hard and you were confused at first, but leave them with the truth in how you worked through what was troubling to get a great result, and how you are proud to have done so because you know the girls will have fun doing these badges!	
	5. Be intentional about your words	
	Girls are like sponges and will absorb our attitudes toward STEM activities and how we handle challenges.	
	Consider what a girl might think about STEM or women in STEM if she heard an adult say "This is just so beyond me" or "I was never into computer stuff" versus "Wow, I've never heard of this before! That's cool." or "We all get to learn about how computers work—even me!". As Girl Scout adults, we have the opportunity to use our words to set the tone and encourage girls to be healthy risk takers.	
	6. Remember it's okay not to know the answer!	
	When our girls are curious and engaged, and it's natural for them to have questions along the way. We love that they are thinking bigger and are confident to ask questions in group settings. For a leader, it's probably impossible that you're going to have an answer to all of their wonderings, especially when you're exploring new topics together like automotive engineering, coding and robotics. In these instances, show girls it's totally okay not to know the answer and say "I don't know, let's figure it out together." Or "Wow, I've never thought about that! I'd love to learn more, too." You can then show girls where to look for answers themselves or work together to look it up online or reach out and ask an expert.	
	Show them that working through the problem and thinking of solutions is exactly what a scientist does every day. Your girls will ask open-ended questions and are curious about concepts we would never all be able to plan for, that's one of the best parts about sparking their imagination in STEM activities!	

TIME	STEPS	MATERIALS
1:10-1:20 (10 minutes)	**Volunteer Toolkit** The next part of this training is for volunteers to get familiar with accessing and the materials in the Volunteer Toolkit. Talking points: • The Volunteer Toolkit (VTK) contains program and meeting plans for Daisy through Ambassador and multi-level troops! It takes the guesswork out of planning and prepping for your troop meetings and makes communication and staying organized seamless. • The meeting aid section is where you'll find a glossary of terms, materials list, handouts you'll be using in the badge and tips for brainstorming. This is why the VTK is so helpful, you can be sure to have all of your resources together before your meetings in one place.	**Access the VTK via girlscoutsdiamonds.org (optional, but recommended for demonstrating how to log-in)** **VTK Breakdown slides with screenshots**
1:20-1:30 (10 minutes)	**Debrief** Reflection after action gives us a deeper understanding of concepts and helps us master skills. This is true for troop meetings, training sessions, and lots of other Girl Scout activities! Volunteers might have their girls have a friendship circle at the end of a meeting to reflect on what they learned, and this is a positive send-off as girls are heading out. • Something new you learned today • Takeaways about talking to your girls about STEM • How you can encourage your girls to choose and explore STEM **Closing** Thank you so much for attending this training! We hope you gained something from learning about how to enrich your girls' experiences with STEM and are excited to lead them through STEM programs like the Coding Basics badge. For more information and examples on the Coding Basics activities, I encourage you to watch the videos of Coding Basics badge activities on the STEAM Center website. Next, check out the VTK and the STEM badge resources such as badge trainings and more activity videos. You can even peek at the next two coding for good badges, digital game design and app development. Be brave and persevere, because you've got this! As always, share your pictures with us at	

TIME	STEPS	MATERIALS
	online@girlscoutsdiamonds.org, and email program@girlscoutsdiamonds.org with questions or to connect with our STEAM Coordinator. Thank you!	

COMPREHENSIVE LIST OF SESSION MATERIALS (APPENDIX)

- Patch Quilt Algorithm handout (in file)
- Blank Patch Quilt handout (in file)
- Coding Basics badge activity breakdown (slide)
- Girl Scout Leadership Experience Model (screenshot or PDF)
- GSUSA STEM Outcomes PDF (in folder)
- STEM badge and journey list (slide)
- VTK breakdown (slide)
- Post-training survey
  - How clear was the information in this training?
  - How do you feel about the amount of information presented?
  - Any other comments, questions or concerns
  - Did this training help increase your confidence about STEM

STEM badges and journey category slide:

Coding Basics activity breakdown chart:

Volunteer Toolkit breakdown with screenshots:

Volunteer Toolkit (VTK)

The **Meeting Aids** include

- Glossary
- Materials list
- Handouts to be used for specific meetings
- Brainstorming tips
- Girl Scout Promise & Law
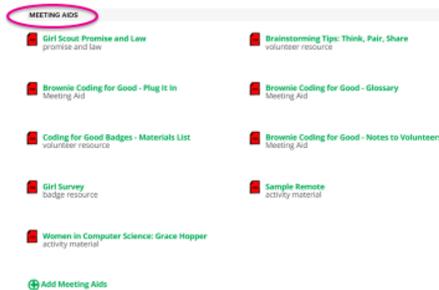
The **Materials List** lists materials for the meeting

MEETING AIDS

- Girl Scout Promise and Law
  promise and law
- Brownie Coding for Good - Plug It In
  Meeting Aid
- Coding for Good Badges - Materials List
  volunteer resource
- Girl Survey
  badge resource
- Women in Computer Science: Grace Hopper
  activity material

- Brainstorming Tips: Think, Pair, Share
  volunteer resource
- Brownie Coding for Good - Glossary
  Meeting Aid
- Brownie Coding for Good - Notes to Volunteers
  Meeting Aid
- Sample Remote
  activity material

⊕ Add Meeting Aids

GSLE Outcomes Model

Focus of Girl Scout Activities
- Discover
- Connect
- Take Action

Girl Scout Processes
- Girl Led
- Learning by Doing
- Cooperative Learning

5 Short Term Outcomes
- Strong Sense of Self
- Positive Values
- Challenge Seeking
- Healthy Relationships
- Community Problem Solving

Long Term Outcome
Girls lead with courage, confidence, and character to make the world a better place.