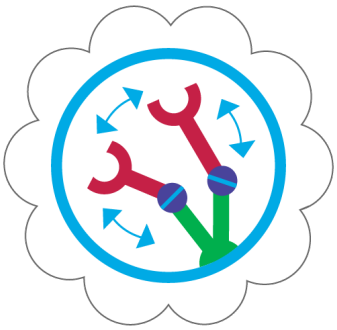
girl scouts of wisconsin badgerland

Daisy STEM



Badge in a Box

Design a Robot (Robotics 3)

Overview for Leaders	These kits are designed to allow a leader to conduct a Daisy meeting with less planning, less effort, and less cost. Most activities will try to minimize the amount of reading required because Kindergarteners aren't ready for it. In the kit, there are activities and supplies. Many supplies are provided, but not all. Make sure to look at the Materials list for the activities so that you have some lead time to order or shop. Normal troop supplies, such as scissors and markers, will be needed. Those are specified. Copies may need to be made. Materials or game pieces for each activity are designed so that 12 girls can do the activity at a time. Near the end of this Leader Guide, there are ideas for other activities that either take more preparation, more lead time, or more supplies and money. If something catches your fancy, you can pursue it. However, the supplies will not be in this kit and will need to be acquired. Please be a sister to the next troop when using these materials. Put them away in the same manner as you received them and report any broken/missing items when returning the box to Badgerland.
This Activity Matches These Badge Requirements	1. Plan your robot 2. Create a prototype 3. Get feedback on your robot
Outcomes	Overall ● Strong sense of self: Girls have confidence in themselves and their abilities, and form positive identities. ● Positive values: Girls act ethically, honestly, and responsibly, and show concern for others. ● Challenge seeking: Girls take appropriate risks, try things even if they might fail, and learn from their mistakes. ● Healthy relationships: Girls develop and maintain healthy relationships by communicating their feelings directly and resolving conflicts constructively. STEM ● STEM Interest: Girls are excited about STEM subjects and want to learn more about them. ● STEM Confidence: Girls have confidence in their STEM skills and abilities. ● STEM Competence: Girls think scientifically to solve problems. ● STEM Value: Girls learn the importance and relevance of STEM to people and society.

Materials Troop Needs to Supply and Preparation Actions	● Air dry clay (such as Model Magic) or playdough (optional for Activity #2) ● newspaper or plastic to cover tables if using clay/playdough ● Pencils with erasers (all activities) ● Crayons/markers/colored pencils (Activity #2) ● Copy All About My Robot worksheet from master ● Copy Plan my Prototype worksheet from master
Contents in the Box	0. Master set of activity sheets o All About My Robot worksheet master (Activity #1) o Plan my Prototype worksheet master (Activity #2) 00. Leader's Guide 01. Emoji stickers (Activity #3)
#1: **Activity: All About my Robot**	**Materials:** ● All About my Robot worksheets (master provided, troop makes copies) ● Pencils with erasers (troop provides) ● Crayons/markers/colored pencils (troop provides) **Preparation:** Copy the All About my Robot worksheets, 1 per girl plus one for the instructor/leader. **Activity:** 1. For this activity, the girls will think about designing a robot that they would invent. Prompts on the worksheet help her think of important components to make up her robot. 2. Hold up a copy of the worksheet and point to the first box in the upper left corner of the page. Read the prompt aloud: "What parts does my robot have?" a. If girls are having trouble, remind them about some of the parts you discussed in the last two sessions of the robotics badges. Parts could be arms, antennae, wheels, legs. Parts could also be buttons and switches, special languages, sensors or "eyes" that help the robot see, and more! 3. Ask the girls to draw or write about the parts their robot will have. 4. Point to the box in the upper right corner of the page. Read the prompt aloud: "How does my robot move?" a. If girls are having trouble, remind them about some of the movements you discussed in the last two sessions of the robotics badges. Robots might follow a track or a special

	program. They might use sensors to understand their environment. 5. Ask the girls to draw or write about how their robot moves. 6. Point to the box in the lower right corner of the page. Read the prompt aloud: “How does my robot talk?” a. If girls are having trouble, remind them about some of the ways robots communicate as you discussed in the last two sessions of the robotics badges. Some robots use special languages like binary code to understand instructions. Some robots make noises or use lights to communicate. 7. Ask the girls to draw or write about how their robot talks. 8. Point to the box in the lower left corner of the page. Read the prompt aloud: “What work does my robot do?” a. If girls are having trouble, remind them about some of the work robots do as you discussed in the last two sessions of the robotics badges. Robots can help people do all kinds of different jobs, such as vacuuming the floor, cutting the grass, reminding people about tasks, looking up information, rescuing people in emergencies, and even driving cars. 9. Ask the girls to draw or write about the work their robot performs. 10. Leave the last prompt blank for now. You’ll use this in the third activity.
#2: **Activity: Plan My Prototype**	**Materials:** ● Plan my Prototype worksheets (master provided, troop makes copies) ● Pencils with erasers (troop provides) ● Crayons/markers/colored pencils (troop provides) ● Air dry clay/model magic/playdough (optional) (troop provides) ● newspaper or plastic to cover tables if using clay/playdough (optional) (troop provides) **Preparation:** ● Copy the Plan My Prototype worksheet for every girl from the master set. ● If using clay/playdough, provide enough material to each girl to create. You may want to cover tables in newspaper or plastic tablecloth to protect it from staining. **Activity:** 1. For this activity, girls will draw their design for their robot, based on the attributes they created in Activity #1. Give each girl a prototype activity sheet, drawing utensils, and clay/playdough (if you are using it).

	2. Provide girls with as much time as possible to draw/craft their robots. If they are making 3D sculptures, make sure to take photos or have them recreate their sculptures as drawings. Photos can be attached to the prototype worksheets. 3. Encourage girls to come up with a name for their robot and write it on their sheet.
#3: **Activity: Presenting my Invention**	**Materials:** ● All about my Robot and Prototype worksheets (filled out) ● 3D sculptures made from clay/playdough (if available/optional) ● Emoji stickers (provided) **Preparation:** Distribute emoji stickers to volunteer adults to give to girls after they have shared their designs. **Activity:** 1. In this activity, girls will share their prototypes with their Girl Scout sisters and any volunteers present. 2. Explain to Girl Scouts that presenting inventions is an important part of being a robot inventor. Showing off the prototype is called a "pitch," just like throwing a ball in a game of softball or kickball. An inventor making a "pitch" hopes that someone will want to manufacture their invention and give it to people that need it. That would be a "home run!" 3. Ask girls to volunteer to share their robot's name and picture, then share what kind of work it does. Give the Girl Scout enough time to point out all of the things that make her invention unique. 4. After her presentation, ask the group to decide on 2-3 emoji stickers that represent how you feel about her design. She can stick the stickers in the feedback rectangle on her All About my Robot worksheet. 5. After everyone has shared, thank the Girl Scouts for all of their hard work! They've completed all three Daisy Robotics badges!
Optional: **Activity: Women in Robotics**	Take your learning a step further by learning about women role models in robotics. 1. Ada Lovelace: Ada was a mathematician and computer programmer, long before the invention of computers! She wrote the first algorithm (a type of computer program), which tells a machine what to do. 2. Grace Hopper: Grace was a computer programmer in the U.S. Navy. She wrote a computer program called COBOL that is still used today!

	3. Ruzena Bajcsy: Ruzena immigrated to the United States from Bratislava during World War 2. She works for a university and researches artificial intelligence (AI). 4. Maja Matarić: Maja creates robots that help people with special needs, especially older adults and children with autism. 5. Ayanna Howard: Ayanna's favorite TV show was *The Bionic Woman*, and it inspired her to become a robotics engineer. 6. Cynthia Breazeal: Cynthia, a former Girl Scout, started her own company for personal assistant robots. She also invented one of the "50 best robots of all time," which she called *Kismet*. 7. Ayorkor Korsah: Ayorkor is from Ghana, a country in Africa. She started an organization to share robotics education in 2012, called the African Robotics Network (AFRON). One of AFRON's first projects was to build a $10 robot!
End	**Great! You have completed the Daisy Design a Robot badge. Hope you had fun!**
Supplies	**Consumables to be replenished by Badgerland** ● Emoji stickers