What's New for Junior Girl Scouts

Robotics Badges

Engineering Journey - Think Like an Engineer

Computer Science Journey - Think Like a Programmer

Outdoor Stem Journey – Think Like a Citizen Scientist

TAKE ACTION

TAKE ACTION

TAKE ACTION

Camper

Outdoor Journey

Animal Habitats

Eco Camper

TAKE ACTION

= Current badge
= New content

Eco Camper

Whenever you step outdoors, you are a guest in nature's home. This is especially true when it comes to camping. Whether or not you've been camping before, you will earn this badge by learning how to protect the environment on your trip. It will shape the way you camp forever!

1. Learn the Leave No Trace Seven Principles
2. Plan meals with the environment in mind
3. Prepare a minimal impact campsite
4. Have fun with Leave No Trace
5. Take a conservation hike

When I've earned this badge, I'll have learned skills for minimal impact camping and know how to protect the environment when I go outdoors.

ROBOTICS BADGES –JUNIORS

Requirements, detailed directions, lists of materials required and supporting materials are all available on the volunteer tool kit (VTK). General requirements for each badge are available for purchase but you still need to use the VTK for detailed information and supporting materials. These are "unplugged" activities that do not require the purchase of robotics kits. These badges form a progression, so they must be done in order.

Programming Robots

Robots are simple machines made of many different parts that are programmed to run automatically. Programmers are the engineers that create step-by-step instructions, or algorithms, that tell robots how to understand and respond to their environment. Start by engineering a simple machine that helps a robot to land then learn about the robot brain. After, create programs for your friends to make images using tangrams and complete an obstacle course before coding on a device.
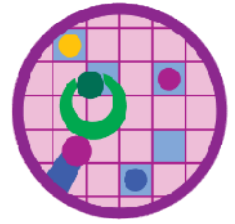
1. Learn how robots work – Girls build a "safety lander" that can gently land a ping pong ball in a cup (simulating a Mars lander) when dropped from modest height.
2. Discover the robot brain – Girls do an activity to relay messages with their fellow scouts to discover how robots send and receive messages between the robot brain and the robot body.
3. Learn about programming– Girls create a program (a series of directions) to instruct a "robot" friend (another scout) to build an image made of tangrams.
4. Try simple programming – Girls create their own special coding language to create step by step algorithms for their "robot" friend (another scout) to stack cups.
5. Code a robot – Play a game from the Hour of Code website, https://hourofcode.com/us.

When I've earned this badge, I will know how robots receive instructions in a way similar to the human brain. I will be able to create simple programs that could be run by a robot.

Designing Robots

Robot are simple machines that run automatically, made of many different parts, each with its own important job to help the robot. Sometimes, engineers use biomimicry to design robots that look like or are inspired by humans, animals, and nature. Increasingly, engineers are able to create robots that continue to learn about their environment. Work in teams with your fellow Juniors to explore artificial intelligence (AI), then think about how technology and robotics can help the world. After, it's time to put it all together and design your own robot! Work like engineers to plan and build a prototype of your robot that solves a global problem. Test and share your robot prototype with other Juniors for ideas on how to make it even better.
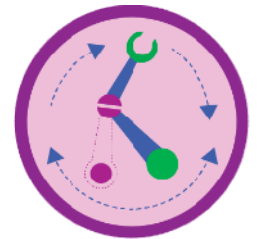
1. Discover the future of robots – Girls learn about biomimicry. Leaders discuss what intelligence means and do an activity with the girls to identify things that display intelligence.
2. Determine your robot's expertise – Leaders challenge the girls to think about what they could teach others to do, and to create a "program" for their talent. Girls brainstorm ways to add technology and innovation to solve problems and teach others.
3. Plan your robot – Girls imagine a robot that solves a problem for other people or animals. They brainstorm and sketch their ideas. Girls share theirsketches with other Juniors, and choose one to create in step four.
4. Create a prototype - Girls draw a prototype or make one using common materials like cardboard, paper and string. Girls create a step-by-step program (series of instructions) for theirrobot prototype to "run."
5. Get feedback on your robot–Girls test their prototypes according to their programs, and "debug" or fix problems. They share with their troopand get feedback on how to improve their robots.

Showcasing Robots

After engineers build their robots, they show them to other engineers and enter them into challenges and competitions. Now that you have your robot prototype, it's time to create a presentation and share your design with others. After, learn about robotics teams and competitions and see a robot in action!

1. Create a presentation to share how you designed your robot– Girls create presentations to share how they designed their robot (video, collage, show/tell).
2. Tell others how you designed your robot – Girls share their presentations with friends and family or at a school or community event.
3. Learn about robotics competitions – Girls go to a competition or science fair, or talk to someone who competes in robotics competitions, or watch videos online about robotics competitions.
4. Learn about robotics teams – Girls join a robotics team, or talk to someone who has been on a team, or learn about teams online
5. See robots in action – Girls go on a field trip to see a real robot, or talk to someone who has been in a lab or used a robot, or see a robotics lab online.

Note: Unlike the other Robotics badges, these Steps include options. You may be able to complete multiple steps, particularly for Step Three through Step Five, at once.

When I've earned this badge, I will have shared my prototype and design process with other. I will see a robot in action and learn about robotics teams and competitions.

THINK LIKE A CITIZEN SCIENTIST – JUNIOR

In this journey, scouts do a citizen scientist activity from Scistarter.com. Detailed instructions and supporting materials for this journey are available only on the Volunteer Took Kit (VTK) at gscsnj.org, MYGS, for registered leaders.   You MUST create a Girl Scout Scistarter account.   **Sign up at scistarter.com/girlscouts/volunteer/landing.**   They have set up a part of their website just for Girl Scouts, where they have videos about projects that have been pre-selected for Girl Scout troops.It is better if you have internet access and devices for the girls to access the website directly. If this isn't possible, you can download some of the information or describe projects from the website.

Session 1: Observing with Detail and Precision
- Discuss what scientists do and introduce citizen scientists. Citizen scientists are ordinary people that help scientists with their research projects.
- Show the Juniors half of the project videos on Scistarter in the Girl Scout section. You can do this online, download the videos in advance onto your device, or just describe the projects to your scouts. You can only get to these videos from your Girl Scout SciStarter account at scistarter.com/girlscouts/volunteer/landing.
- Play Kims game: The girls observe 10-15 small items from nature that are displayed, then covered. Try to use objects of the same type (i.e. 3 different rocks). Use this activity to teach the girls the value of writing down what they see. To teach the girls precision and detail, run a similar game in which girls write down a description of an item for other girls to guess the item.
- Girls learn to make scientific observations, by doing this about their meeting space.
- Introduce the concept of a take action project. Girls begin brainstorming about project ideas. The Volunteer Tool Kit has a "take action guide" for leaders.

Session 2: Learn to collect data
- Each girl makes a field notebook by folding paper in half, stapling the middle and decorating with markers/stickers. (Or, the leader provides the notebooks and the girls decorate theirs.)
- Show the Juniors the other half of the videos on Scistarter in the Girl Scout section. Have them vote and select a project to do in session 3.
- Animal Tracking Field Notes Activity: Leaders print, copy, and cut out animal tracks from the VTK. Then, distribute and redistribute them in your meeting space for 3-4 observation periods. The Juniors will observe, record, and graph their data.   Then they share and analyze their results.
- The girls brainstorm about possible take action projects, building on the list started in session 1.

Session 3: Be citizen scientists
- The troop does the citizen science project that they selected in session 2, one that was featured in the project videos in the Girl Scout section of the Scistarter website.   For example, this could be taking photos of clouds at specific times, taking photos of the night sky one hour after sunset, observing the squirrel population at home/school, or creating a picnic for ants and reporting on their behavior. Most activities will require a cell phone or tablet to record and report data.
- The troop chooses a take action project, using the "fist to five" method of voting (described in the VTK) which allows them to show degrees of interest, not just yes/no.

Sessions 4& 5: Take action project
- Troop plans and does their take action project. For this journey, a logical take action project would be for the girls to raise awareness of citizen science. This could be show-and-tell in their classroom, making a presentation to another troop or at a Girl Scout, school or community event, or having a booth/display at a Girl Scout or community event to promote citizen science.

Session 6: Award badges, celebrate, recap and do GSUSA Survey

THINK LIKE A PROGRAMMER – JUNIOR

This journey teaches how to think like a programmer (but not to do actual programming). These are "unplugged" activities, which do not require access to computers. Detailed instructions and supporting materials for this journey are available only on the Volunteer Took Kit (VTK) at gscsnj.org, MYGS. Many of the activities in this journey come from Code.org, a non-profit dedicated to giving every student in every school the opportunity to learn computer science. See www.code.org. There are instructional videos for many of these activities. Sessions 2 & 3 of the Brownie and Junior journeys are quite similar.

Session 1: Algorithms
- Girls create a code, like a type of code used to write secret messages.
- Girls discuss what computer programmers do. Leaders introduce the concept of computational thinking, which is taking big, big problems and breaking them down until they can create a program or solution that works for everyone.
- Tangram Algorithms: Girls learn that algorithms are a set of steps. Then, they create algorithms for another scout to be able to assemble a tangram puzzle. (Note: this activity is also in one of the Junior robotics badges.) Paper tangram materials are provided in the VTK.
- Leader introduces the concept of a take action project. Girls begin brainstorming about project ideas. The Volunteer Tool Kit has a "take action guide" for leaders.

Session 2: Functional Programming
- Girls create an "algorithm" to assemble their ideal snack from the various components provided (i.e. crackers, spreads and other toppings, or components of a trail mix).
- Girls do a Mad Glibs (like Mad-libs) activity to teach the girls about abstraction and to demonstrate "variables" in a fun way.
- Functional Suncatchers: The girls talk through how to write a "program" to make a suncatcher (i.e. bead, knot, bead, knot, spacer, knot, bead, knot, etc.). Then, leaders introduce the concept of "functions", which are a set of instructions (i.e. bead, knot, bead, knot, spacer, knot), and have them write their program using functions. Leaders introduce the concept of "variables", in this case a special bead. A worksheet is provided for this in the VTK. Then, the girls make their suncatchers using their "programs."
- Girls brainstorm about possible take action projects, building on the list started in session 1.

Session 3: Innovation and Rapid Prototyping
- Girls make a collage using pictures from magazines, showing how technology has changed products (i.e. smart watch, cell phone). If the girls can't find what they need, they can draw it.
- Personal Innovations: Girls choose a special skill (i.e. play soccer, draw, dance), and choose something they could teach someone else how to do (i.e. kick a ball into the goal, draw a house). Then, working in small groups, they write an algorithm (at least three steps) for one of these. Then they test their algorithm by teaching other groups of girls.
- Girls brainstorm technological innovations (e.g. self-driving cars, house-cleaning robot). Then they draw a prototype, post the drawings on a wall, and view their gallery of prototypes.
- The troop chooses a take action project, using the "fist to five" method of voting (explained in the VTK) which allows them to show degrees of interest, not just yes/no.

Sessions 4& 5: Take action project
- Troop plans and does their take action project. This could be an activity like making an inspirational video, a class show-and-tell, making inspirational posters for theirschool, or teaching an algorithm activity to others.

Session 6: Award badges, celebrate, recap and do GSUSA Survey

THINK LIKE AN ENGINEER JOURNEY – JUNIORS

This journey is designed to teach girls a basic design-thinking process (brainstorm, design, build, test, share, reflect). Detailed information on how to lead this journey is available on the Volunteer Tool Kit (VTK). This document is designed to give leaders an overview of this journey. Basically, during the first three sessions, the girls will do a design challenge at each session, in which they will build something using everyday materials. Interspersed among the three design challenges, the girls will brainstorm, discuss, and choose a take action project. The VTK has guidelines for leaders on take action projects, as well as examples of projects. Then the troop plans and does their take action project in session 4 and 5. Session 6 is a wrap-up session.

Session 1:
- Introduce the girls to engineering.tell them engineers solve problems using the Design Thinking Process. The process consists of 1) brainstorm & design, 2) build & test, 3) share & reflect.
- Design Challenge – Paper Structure (35 minutes): Engineers build structures out of materials. In pairs, the girls build a structure out of 8 sheets of newspaper that is at least 8 inches tall and can support heavy books.   The leader demonstrates how tightly rolling the newspaper makes it a stronger building material. The leader also bends a newspaper roll into a triangular shape vs. a rectangular shape, and shows which one is more stable.Follow the Design-Thinking Process.
- Introduce concept of doing a take action project. Suggest doing a project related to the environment and upcycling/recycling.

Session 2:
- Girls sketch a building that an engineer might design – any type of building
- Design Challenge – Emergency Shelter (35 minutes): Working in small groups, the girls will build an emergency shelter large enough to fit one person. You can either do this full scale or you can have them make a doll sized shelter. The girls will need to make a stable frame and a cover for the frame. For a full scale shelter, you would provide materials like: cardboard, plant stakes or wooden dowels, large garbage bags, duct tape and string.Follow the Design-Thinking Process.
- Show the girls examples of shelters, and discuss if there are any ideas from those that they would use if they did this again.
- Brainstorm take action projects, using a handout which has guidelines and suggested projects.

Session 3:
- Play music – the girls do a "shake it up dance". Pretend the earth is moving under your feet.
- Girls discuss and choose a take action project. Have them vote using "fist to five" (explained in the VTK) which allows them to show levels of interest, not just yes/no.
- Design Challenge – Seismic Shake-Up (35 minutes): Begin by showing the girls the Ring of Fire map, which shows where 90% of all earthquakes take place. Engineers build structures to survive earthquakes. They test their concepts by using a shake table. In groups of 3-4, the girls will design and build a structure that can survive a shake table test. The girls will build their structure using coffee stirrers, modeling clay, and a manila file folder. The leaders will supply a shake table for each group which they make out of cardboard, rubber bands, tennis balls, large binder clips and a ruler or paint stirrer. Follow the Design-Thinking Process.
- Do a Shake-it-up dance. The girls dance while the music plays, and freeze when it stops.

Sessions 4& 5: Girls plan and do their take action project.

Session 6: Award badges, celebrate, recap and do GSUSA survey.