Girls of Steel's Outreach Catalog

Hi! Welcome to Girls of Steel's **FIRST Outreach Catalog**. This is a comprehensive guide to how to run and participate in outreach that will continually be updated as more events and information is created/found. You can use some of these templates provided to use in your own team.

The following pages include information about our most popular outreach systems. You'll find a brief description and all our curriculum/materials for the event. We encourage you to utilize these materials, they range from handouts to email templates. Our hope is that this catalog eventually becomes a shared resource for all FIRST teams. If your team has an initiative you would like to share, you can use the following template and add to this catalog. Hopefully, we can pool our outreach knowledge and expertise to have a greater impact!

We debuted this catalog at the Houston World Championship in 2022 and in the 2022-2023 season we started collaborating with other FIRST teams to expand it. If you have an event you believe should be shared with other FIRST teams you can contact us and we'd love for you to add it. You can find a basic template of how we'd like to have inserts [here](#) (make sure to add your team colors). Contact us at girlsofsteelrobotics@gmail.com with any questions!
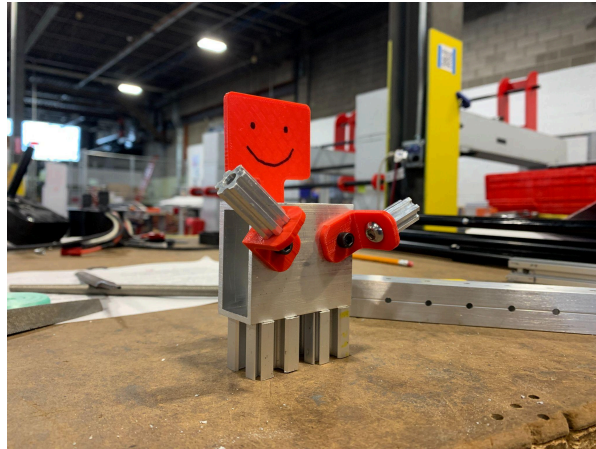
Chassis Project

Girls of Steel has run the Chassis Project since 2013, making it one of our most popular outreach events. During the event, which runs for about two hours, participants assemble, wire, and drive a robot chassis. There is no age requirement for the Chassis Bot, and young kids can participate by driving the robot instead of assembling it. We often have a pre-built one that kids can drive and a kit for assembling. The Chassis Project is an excellent way of introducing kids to hands-on STEM activities and teaching people that they are capable of building awesome things like robots! If you are in the Pittsburgh area and are interested in borrowing our Chassis Kits you can contact: girlsofsteelrobotics@gmail.com.

You can find a video tutorial and Chassis Project Instructions 2023 Update online for your usage and to learn more

Meep Boops

The Meep Boop initiative, launched in 2022, enables children to construct and take home a small robot during outreach events. Recognizing that the chassis project appealed more to older age groups, we developed Meep Boop to offer an engaging experience for younger audiences. These activities are ideal for one-day events and can seamlessly integrate into workshops, enhancing the overall learning experience. We have found much success with these robots and have even done events with Girl Scout Troops in the process.

If you are looking for more information check out our assembly instructions or reach out to us at girlsofsteelrobotics@gmail.com

LEGO Workshops

The workshops commenced in the fall of 2023 with the purpose of engaging underrepresented communities and fostering their interest in STEM fields. Our LEGO Workshops are meticulously crafted to address the unique needs of each community, ensuring they are equipped with all necessary materials. This tailored approach is highly effective, as each activity is designed to resonate with the mindset of the children involved. The workshops offer a versatile selection of kits, allowing communities to customize their curriculum and provide students with a comprehensive learning experience. If you want to know more about them please email us!

Duck Kits:
This exercise introduces basic engineering concepts, demonstrating how individuals can approach building in various valid ways. Students are tasked with creating their interpretation of a duck, showcasing the diversity of engineering approaches and highlighting that there is no singular "correct" solution.

Lever/Gear Kits:
This exercise provides an introduction to gears and levers, essential components that students will utilize in future activities. Gear ratio and weight load is taught in this part of workshops

Carousel/Windmills:
Utilizes the skills learned in the previous levels, and builds either a windmill or a carousel that they can later program with through SPIKE Prime programming language. It really is an engaging way to showcase the knowledge students have learned throughout the program.

Cranes:
For students seeking an additional challenge, this activity serves as the ideal culmination of the workshop. It represents a step up from the Carousel and Windmills, offering participants the opportunity to work with a greater variety of LEGO pieces and engage in more intricate coding tasks using SPIKE Prime

FLL Skills Summer Camp

FLL Skills Summer Camp is a two week program that gives 4th-8th graders a taste of FIRST LEGO League Challenge. It takes students through various activities and lessons surrounding pseudocode, programming, reverse engineering, and a traditional FLL research project. GoS ran this program virtually in 2020 and 2021 where attendees received a kit in the mail with various materials. We returned to an in-person program in 2022. Currently we run our program so that the 1st week we focus on SPIKE Prime and the 2nd week we focus on building the

This camp is an excellent way to recruit students into FLL Challenge or transition from FLL Explore students into FLL Challenge. We highly recommend inviting multiple team mates or friends to serve as mentors for this camp.

We had one slideshow for our 5-day, 90-minute sessions virtual camp (2021) and one slideshow for our 5-day, 9 am to 3 pm, in-person camp (2022). Repeat the schedule based on the corresponding theme(Programming or Robot)

Day 1 gives students and mentors time to introduce themselves, FIRST, and their robotics team. They also listen to mini-lectures about FIRST core values (and do a corresponding activity) and pseudocode.
Day 2 introduces SPIKE Prime programming and the FLL project/SPIKE Robot. Learn the game from the previous year.
Day 3 focuses on the engineering/design process and reverse engineering! And, once again, students work on their research projects in their groups.
Day 4 allows students to further explore SPIKE programming and work on their projects/Make attachments for robots.
Day 5 is focused on wrapping up their projects and showcasing their creations to mentors, classmates, and parents, as well as running a practice match for the robot.

Presentation about FIRST or your team

If you live in an area that is severely underrepresented in STEM or you feel like people in your community should know more about STEM or FIRST, you can give a presentation. Girls of Steel has an introductory slide deck already made which you can use as an example of what information we choose to include when we make a presentation. Feel free to use it as inspiration.

Starting a FIRST LEGO League Team

FIRST LEGO League is a robotics competition run by FIRST for students in Pre-K through 8th grade. Divided into three categories (FLL Discover, FLL Explore, and FLL Challenge) the program focuses on giving students coding and building skills and an opportunity to think creatively about the problems facing society.

Starting an FLL team can be daunting to many teams. In 2022 our FLL-Leads created a [how-to guide](#) for planning an FLL season. The how-to guide contains an entire season's worth of curriculum, an intro to FLL Challenge, and a brief summary on how we run FLL Challenge at 3504.

📄 How To: Run FLL Challenge

Intro to Scratch
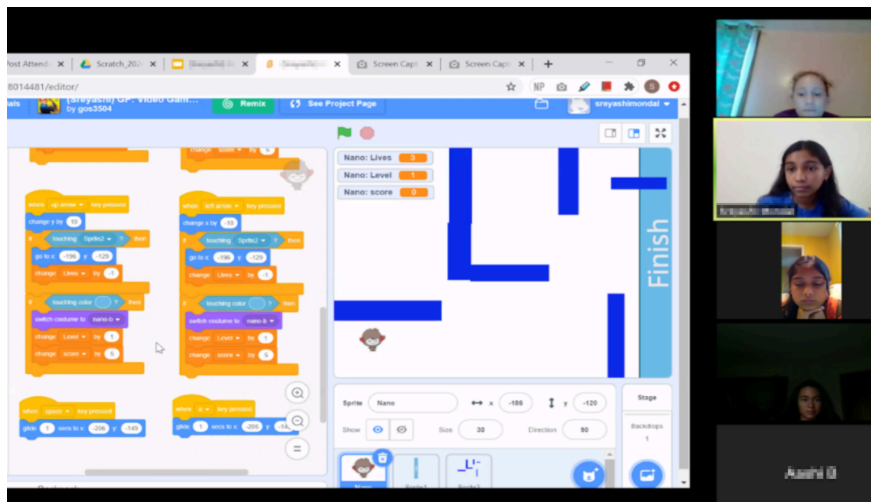
Intro to Scratch is a five-session program for 4th-8th grade students that, you guessed it, introduces students to scratch. The program is geared towards beginner and intermediate scratch users and can be run online or in-person. It's a very scalable event - individual members have run it for 5 students and we as a team have run it for 50. The biggest limiting factor is the number of mentors available, although we encourage you to get teammates and friends involved if you're looking at a class size of over 10 students. We have attached our lesson plan for each day in the links below.

Day 1 goes through the basics of programming, block coding, and the set-up of a scratch account.
Day 2 focuses on Scratch basics. The lesson plan takes students through Scratch terminology and basic function.
Day 3 teaches students how to use "looks" and "sounds" blocks.
Day 4 teaches students about "control" and "sensing" blocks.
Day 5 ends the course with a lesson in "operator" blocks.

Here is our slideshow from SWATposium 2020 where we presented about bringing this camp to your community. It takes you through the timeline for implementing this program and gives you more information about why it is so effective.