



*FIRST* Equity & Inclusion Financing Initiative for  
*FIRST* in Upper Midwest  
(FEI FI FO FUM GRANT)

GRANT REPORT  
Team 2220  
May 31, 2023

## The Goal of the Project

We will hold a series of “girls only” onboarding events led by our female team captain, female leads in electrical and mechanical subteams and female mentors as role models. We will end the training with a networking event at the 3M 3D Rapid Prototyping Lab where the girls join with female STEM professionals in SWE for demonstrations, guidance and encouragement.

The project will focus on a Girls Night in the Shop:

- Power Tool Opportunity (PTO) - Learning to use power tools effectively and safely, including our drill press, band saw, belt sander, riveting guns and CNC machines.
- Electrical Connection Project – Learning to make electrical crimp connections, safe soldering training and using shrink tubing and electrical tape effectively.
- 3D CAD and Printing – Learning basic 3D CAD and use the 3D printers.
- STEM Outreach - Plan and lead an outreach event at one of our community venues.

**Our project goal is to increase the % of girls on the team from 25% to >35% for the 2022-2023 season.**

# How we used the funds

Planned vs. actual use of funds:

- Power tool training: Raw materials for fabrication and assembly training (aluminum sheeting & tubing, polycarbonate sheeting and riveting supplies = \$165 planned; \$195 spent
- Electrical Connection Project: Raw materials for crimping, soldering training (including Underwater Robot kits), crimping kits and shrink tubing supplies = \$610 planned; \$582 spent
- CAD and 3D Printing (mice and filament) = \$74 planned; \$79 spent
- STEM Outreach & Networking – Refreshments = \$45 planned; \$75 spent

**Total = \$894 planned; \$931 spent**

## Outcome and impact of the project on our team

We had 3 girls that were seniors the previous season and had graduated so we wanted to increase the number and the percent of girls on the team. We had 6 new girls participate in Girls' Night in the Shop and were able to get 4 of those girls to join the team. However, we had a larger number of boys join the team this season so while the number of girls on the team was increased, the actual percentage of girls on the team actually stayed at about 25%.

We surveyed the girls who participated in Girls' Night in the Shop and found girls increased their confidence in using power tools from 2.75 to 4.6 (on a scale of 5) and their confidence in joining the team increased from 2.75 to 4.0 (on a scale of 5). Here are a couple of quotes from the girls: "I like how relaxed it was and open to whatever I wanted to try." and "Fun people, great conversations and learning. Really enjoyed every moment." So it did seem that the Girls' Night in the Shop was a good activity to get more girls the confidence to join the team. In hindsight, we probably need to work harder to get more girls to come to the event through broader, more impactful advertising of the event.

In addition to Girls' Night in the Shop, we focused on ensuring that the new girls on the team had meaningful work to do on the team. One student, Reagan, was especially helpful to the team in three areas: she became an Impact Award presenter, she was active on the mechanical team, and she helped with French language translations for our competition in Trois-Rivieres, Quebec/Montreal Regional. Reagan had a huge impact on our team and she has already been promoted to a mechanical lead for the next season! She was a real success story!

Here is a quote from Reagan about her experience on the team this year:

"In my first year on the team, just this season, I attended the Girls' Nights in the Shop where I was able to learn about the different sub-teams and how to use various shop tools. I learned to solder and this was really enjoyable for me so I decided to join the team. I joined the control subteam as well as becoming involved in The Impact Award."

Ava was also especially engaged on the team in her first year. She learned a lot about the design and build process for the robot and we expect that she will be very helpful in this process when we get the new game in 2024.

Two other girls who joined the team were involved in other extra-curricular activities so they were less involved in the robotics team this season, but we will be looking for ways to get them more engaged this next season.

We would like to have even more girls on the team (even if the number of boys increases) so that we can increase the percentage of girls on the team. Based on what we learned this year, we are working on a plan to make additional improvements to recruiting, training and onboarding as well as ongoing engagement to try to achieve this goal.

## Future Plans

Because we did not meet the goal of 35% girls on the team, we recognize that the girls need to be involved and engaged in robotics at the middle school age before they commit to other activities. We were able to start an all-girls FLL team at the Black Hawk Middle School in Eagan that we also mentored. We will be continuing this team this fall and hope that we can get more girls on this team and use this as a feeder program for getting more girls on the Eagan High School FRC team.

We are also going to invite middle school girls to be part of our Underwater Robots competition that we have planned for July. This will give these girls a taste of robotics in a really fun environment. We will also invite them to come to Girls' Night in the Shop as well as the fall onboarding sessions.

We will also do more recruiting at the middle school level to try to get more girls engaged as they move from middle school to high school. They need to feel welcome and they need to feel that they belong and have a place on the team. We will continue to offer a Girls' Night in the Shop as well as new student Onboarding in the fall. We will also start a Girls' weekly meeting during the season for girls and other interested team members to get together and talk about issues and challenges as well as solutions.

# Photos of activities supported by the grant

Chop Saw Training and Soldering Training during Girls' Night in the Shop



## Underwater Robots



## Networking Event at 3M

