

FIRST Impact Award - Team 2883

2024 - Team 2883
Team Number
2883
Team Nickname
F.R.E.D (FIRST Robotics Engineering and Design)
Team Location
Warroad, MN - USA
Describe the impact of the <i>FIRST</i> program on team participants within the last 3 years. This can include but is not limited to percentages of those graduating high school, attending college, in STEM careers, and in <i>FIRST</i> programs as mentors/sponsors.
“FRED builds leaders one robot at a time,” is the slogan of Team 2883. Our goal is to create original and innovative thinkers. 100% of team members have graduated, 68% of alumni members are pursuing careers in STEM related fields. In the last three years 95% of former FRED members are attending or have graduated college. Our mentors are a great help to the team. 92% of current FRED mentors graduated with STEM related degrees. 32% of previous FRED members are mentors or volunteers for FIRST.
Describe your community along with how your team addresses its unique opportunities and circumstances.
Warroad is a town of 1800 people, 6 miles from the Canadian border with 2 stop lights, called "Hockeytown USA" on Lake of the Woods. Two of the teams we helped start are across the border: 3R in St. Malo and Gophertronics in Winnipeg. We leverage our access to Lake of the Woods by doing the Polar Plunge and FriLuftFest, raising money for Special Olympics and volunteering. Members and mentors travel 63 miles through Canada, each day. Marvin is headquartered in Warroad supporting us from year one.
Describe the team's methods, with emphasis on the past 3 years, for spreading the FIRST message in ways that are effective, scalable, sustainable, and creative. How does your team measure results?
We attend and host multiple outreach events per year including “What’s Brewing with FRED”, the FriLuft Fest, and others coming out to 20+ a year. We share our workspace and resources with our local LEGO League, many who will join FRED. In 2023 FRED expanded to Professionalism 201, teaching FRED members how to be inclusive and deal with conflict effectively. We measure personal success through achievements and experience.
Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.

FRED helps chair GNR and introduced one of their largest sponsors, Marvin. At GNR, team members aid in the safety glasses station, resetting the field, flag ninjas, and student ambassadors. During Worlds in 2022, 2 FRED members served as student ambassadors. FRED is a proud, founding member of NMRC. There are 4 alumni that have started FRC teams. 32% of FRED alumni are current volunteers or mentors within FIRST. In 2023, our alumni Sydney Mosher was recognized as Volunteer of the Year at GNR.

Describe your team's initiatives to Assist, Mentor, and/or Start other *FIRST* teams with emphasis on activities within the past 3 years.

In 2024 we started FRC Team 9474 (3R). In Fall 2023, we started a new FLL Explore team 30521 (Warroad Lego Bots). FRED members mentor students from teams: 8188 (Grand Force), 8225 (Rolla, ND), 7048 (Red River Rage), and 4360 (Spudnik). In 2024, we assist the Greenbush Gators (5172) and Roseau Rams (2654) by cutting parts and building field pieces. FRED members mentor Warbotics, 21848. We opened our team in 2023 to include students from Canada and Baudette to join "Robots without Borders".

Beyond starting teams, what initiatives have you done to help inspire young people to be science and technology leaders and innovators? What results have you seen from your efforts in the past 3 years?

In 2023, we started hosting STEM exploration nights and programming sessions in the school and public library. In 2023, FRED invested \$4,000 in Spikes and \$700 in rebuilding WeDo parts. In 2022 we wrote a grant and received funding to refurbish WeDo kits, implemented by FRED into the 3rd grade curriculum. We went from 1 active FLL team to 4 this year because there was so much interest. We still have a waiting list and are recruiting more coaching staff to lead teams next year.

Describe the partnerships you've created with other organizations (teams, sponsors, educational institutions, philanthropic entities, etc.) and what you have accomplished together with emphasis on the past 3 years

The Marvin company is our primary sponsor. We now design our own parts which they assist with carbon fiber printing (2023). We coordinate Marvin staff providing the machine shop at GNR and partner with Northland Technical College for MSSC certification. Our newest sponsors are the Hass Foundation and Raptor shocks. We share many materials and EV3 robots with the school in Sprague, Manitoba grades 9-12 with our "Robots without Borders" program.

Describe your team's efforts in the past 3 years to promote equity, diversity, and inclusion within your team, *FIRST*, and your communities.

Our previous logo with Fighting Rednecks was divisive and we changed that in 2022. Our professionalism classes that all team members participate in address inclusion including diversity, equity, and justice principles with a special emphasis on neurodivergence & social interactions. Our team dinners, movie and "bad art" nights give members a chance to connect "beyond robots". Members on our team are part of our school's Lao Culture Club, assisting with their first outreach event in 2023.

Explain how you ensure your team and the initiatives you have created will continue to run effectively for the foreseeable future

New in 2022, was our "Buddy Program." The Buddy Program has evolved, allowing veteran team members to work one on one with rookie members and for new team members to continuously cycle

through different work areas. This allows students to get exposure to all aspects of FIRST and to hone their interest. Our Lego League program continues to improve, and is a feeder for new team members.

Describe your team's innovative strategies to recruit, retain, and engage your sponsors within the past 3 years

To recruit sponsors, our team requests donations from many organizations. We have a tiered program: partner, innovator, leader and visionary. Sponsors are acknowledged on our robot and our shop window. To retain sponsors, our team presents accomplishments and what plans we have for the future. We've developed a 5 year plan with Marvin, our largest sponsor, scaffolded by steps and goals. To engage our sponsors we go to their businesses and promote STEM activities and connect with the community.

Highlight one area in which your team needs to improve and describe the steps actively being taken to make those improvements.

We have noticed that some of our team members struggle to convey their ideas, lack confidence, demonstrate neurodiversity and struggle with mental health concerns. In our Professionalism 101 & 201 sessions we work on active listening, conflict resolution, communication, and decision making. Our buddy program with pairing and sharing helps support this process. We have also initiated some difficult, but important conversations about inclusion, mental wellness and team identity.

Describe your team's goals to fulfill the mission of *FIRST* and the progress you have made towards those goals.

To spread the message of FIRST north of the border in 2024 we started FRC Team 9474 (3R). In Fall 2023, to reach our younger generation, we started a new FLL Explore team 30521 (Warroad Lego Bots). We engage an older community by visiting our nursing home, promoting FIRST between ages 0-99. In 2024, to inspire future generations we started a FRED Mascot Contest, encouraging creativity and future fans of FRED.

Briefly describe other matters of interest to the *FIRST* Judges, including items that may not fit into the above topics. The judges are interested in learning about aspects of your team that may be unique or particularly noteworthy.

In 2023, to demo an online "Parts Shelf" we shipped extra parts and components free of charge. With interruptions in the supply chain and limited sponsorships, we wanted to share what we have, tying into our sustainability initiative. Robots Without Borders opens our team to surrounding communities, allowing students to join FRED. Members cross the Canadian border to be a part of our team. We use rubber ducks for fun engagement, ducking cars, businesses, doors, quoting "Good Job - FRED 2883".

Judge Feedback

Who/When

Feedback

Apr 07,
2024
12:20:47
PM EST

What areas of expansion or improvement can you recommend for FRED to consider?

An area the team has an opportunity to improve.

Something that really impressed the judges.

Essay

F.R.E.D. (First Robotics Engineering & Design) Team 2883 builds leaders, leaders build communities, ONE ROBOT AT A TIME. Shigley's mechanical design process comes to life with each new engineer, designer, and creative thinker on FRED. The design process is a series of steps that guides our team as we solve problems. We repeat the steps as many times as needed and make improvements along the way as we learn from failure. We work to uncover new possibilities aiming for great solutions, happy to walk away just a bit better than we were before. We continue to define who we are, ask for help, imagine the future, plan for failure, prototype for practice, test the limits, improve ourselves, our community, our world.

Define who we are. Defining who we are starts with understanding FRED. Warroad is a town of 1800 people, located 6 miles from the Canadian border with 2 stop lights. There are 29 members, 76% have 1 year or less of experience, 59% are male, and 41% are female. 100% of students that were on FRED have graduated high school; 68% have gone into STEM related fields; 95% of our alumni within the past three years are in college or have graduated and 32% are current volunteers or mentors with FIRST.

FRED strives to make leaders that will benefit our community. In 2022, FRED had difficult conversations about the image we were projecting and found it no longer represented our group, so a major rebranding took place. FRED was known as Fighting Rednecks Engineering & Design, but is now FIRST Robotics Engineering & Design. Our new logo shows FRED and 2883 all linked together, emphasizing connections and teamwork rather than fighting and rednecks.

Ask for help. Asking for help is a skill that we embrace. We know we will run into problems and won't know how to fix things. Thankfully, we have a group of 16 mentors, available to our team that are always looking for opportunities to pass down knowledge.

FRED emphasizes inclusivity and working together seen through our Buddy Program. New students are paired with veteran students where they're encouraged to ask for help. It is important for each team member to learn about all aspects of FIRST, so all students need to rotate through all the areas of concentration (eg PR, programming, electrical, fabrication, safety, impact) with their buddy. We track and monitor each member's progress through the buddy system.

We ask partners and sponsors for financial support, expanding our school program and supporting WHS students. With Marvin, we have been able to secure funding for programs like Medical Terminology, Introduction to Healthcare Professions, expanding our FLL programs, and a STEM summer camp.

In 2022, we created partnerships with Northland Technical College, the Advanced Resource Center (ARC) and Marvin. Through this, we received funding and a Skillsboss Manufacturing unit to train students to become Certified Production Technicians (CPT) authorized by the Manufacturing Skills Standard Council (MSSC).

To date, our team has brought over \$1 million worth of outside funds into our school, including two CNC mills in the past two years worth \$78,000. Our high school has added engineering and drafting classes for college credit, a FIRST focused robotics class, and a technical education graduation requirement. These classes get students involved with STEM and help them explore different careers.

Imagine the future Imagining the future is one of the most exciting parts of FRED. Through our FLL Teams and elementary school involvement, we're able to start building STEM skills in young children and

create a pipeline of future scientists and Robotics members. In 2023, we started hosting STEM exploration & activity nights mentored by FRED members. Through the summer, we visited local areas and provided LEGO WeDo kits, FLL kits, and offered programming sessions. In 2023, FRED invested \$4,000 in Spikes and \$700 in rebuilding WeDo parts. In 2022 we wrote a grant and received funding to refurbish WeDo kits, implemented by FRED into the 3rd grade curriculum.

We have started three FIRST LEGO League (FLL) teams: 34305 (LEGO the Woods), 21848 (Warbotics) and 44494 (Lao Pow). Warbotics competed at the Detroit World Championships in 2018, and LEGO the Woods both qualified for the state championship three years in a row. We sponsored a junior FLL team 17043 (Stargazers) from 2019-2022. 100% of those kids moved on to join Warbotics and in 2023 and in 2024, they qualified for the MN FLL State. In Fall of 2023, we restarted team 17043 (Warroad Junior Lego League Team) whose previous members had moved on to our FLL team in 2023. We also started a new FLL Explore team 30521 (Warroad Lego Bots). We share our work spaces with our FLL teams, making it easy for FRED members to mentor the younger students and inspire a love of STEM.

Bringing FIRST to new areas. In 2024, we started and mentored team 9474 (3R Red River Resistance). FRED members and 3R members travel 83 miles to assist each other in this upcoming season.

Four of our former FLL and FRED members are currently mentors for Team 8188 [Grand Force], Team 8225 [Rolla, ND], Team 7048 [Red River Rage], Team 4360 [Spudnik]. They are a part of our past and contribute to another team's future.

Plan for failure- Things are going to go wrong, that is inevitable, so it is best to be prepared. When you are prepped for failure, it sets you up for success. In 2023, we failed to upload our essay for the Impact Award and missed the opportunity to compete for it. Instead of letting this discourage us, we recalibrated and focused our efforts on the Engineering Impact Award. Through revision and preparation we gathered a team to present and speak to judges. Our efforts were worth it and we won the Engineering Impact Award at the GNR. This award granted us a ticket to Worlds along with our robot, which won the competition at GNR.

Setbacks aren't permanent. Failing means you tried. We are prepared for failure and for mistakes, but we don't let these challenges discourage us. We will overcome them.

Prototype for practice- "Practice makes perfect." A common phrase, but our team is adamant about teaching students how to prototype to improve on skills. Team members use Inventor to draw parts for the robot, which become prototypes that we 3D print.

In 2023, we partnered with Marvin to create carbon fiber printed parts. Marvin is our largest sponsor and has been with us since our rookie year in 2009. Marvin allows students to practice their skills and "prototype" their careers, by offering internships in engineering, accounting, marketing & machining. Students become proficient prototype designers and incorporate advanced skills into their daily lives. New in 2024, we have a 3D carbon printer. Now FRED members and WHS students have the ability to print parts directly from our shop.

Test the limits. FRED is willing to test the limits by braving sub zero temperatures to jump in a lake as a team for Polar Plunge. This event raises money for the Special Olympics and every year more team members participate. Another favorite outreach is skating on the river with our robot at FriLuftFest, a local

nordic festival.

Some of our team members drive 63 miles to come to school and practice. Our location brings challenges, but that doesn't hinder FRED from connecting with others. We have sent VEX robots and LEGO supplies to Sprague, Manitoba along with lessons for students.

Our "Robots without Borders" program allows students to travel across the border and help schools that can't afford a robotics program. In 2024, we started and continue to mentor Team 9474 (3R Red River Resistance). This year, FRED members and 3R members travel over 80 miles to assist each other and share ideas.

Improve yourself, your community, your world. FRED is focused on the bigger picture. Our team members are determined to continue bettering themselves in order to better our team and our community. Our team has chosen to exemplify the values of FIRST by volunteering to assist teams. In 2020, team 8225 (Robodogs) Rolla, ND came to our shop with a kit of parts and left with a working robot in one weekend. In 2023, we are continuing to help with their building process & parts. One of our 2020 graduates serves as a lead mentor for their team.

In 2023, our head programmer worked with Greenbush Team 5172 to aid in programming their robot. Later, at the GNR competition, we made an alliance with them and won the competition. In 2022 we helped Roseau Team 2654 build their field, gave them a chassis and cut parts for them. We have continued with parts assistance for Roseau, the Greenbush Gators, Team 5172, and the Aerobots, Team 8878, in 2023 by cutting parts for them. We are excited to help chair the Great Northern Regional and return to competition once again in 2024! Marvin is a primary sponsor for this event. Our alumni make up a large retinue of volunteers for this event. At GNR, our team handles pit safety glasses stations, resetting the field, act as flag ninjas and do student ambassador tours. We were proud to have two FRED members serve as student ambassadors at the World Championships in 2022.

New in 2023, is Professionalism 201, expanding beyond Communication 101, started in 2020. In Communication 101, students have sessions to work on active listening, eye contact, verbal and non-verbal communication, and confidence building. Professionalism 201 focuses on conflict resolution. With a very diverse team valuing open communication, conflict is anticipated. Students practice working on idea generation, how to assess their personal conflict style, and how to work through differences. These exercises allow us to spread the message of FIRST, are scalable, and can be reproduced with other teams.

Through improving our team, we can improve our community, and it only goes up from there. FRED builds leaders, leaders build communities, ONE ROBOT AT A TIME. ;

