Chairman's Award - Team 4613

Print Close

2021 - Team 4613

Team Number

4613

Team Nickname

Barker Redbacks

Team Location

Sydney, New South Wales - Australia

Describe the impact of the *FIRST* 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 *FIRST* programs as mentors/sponsors.

80% of 4613 graduates have entered STEM courses in university. 20 of our alumni have become mentors in the FIRST program here and overseas and have achieved great feats in the STEM community. 3 4613 graduates have created startups. As an example of our success, Dean List winner Sean Zammit received a leadership scholarship at UNSW and Alastair Pilley continues to mentor and upskill FRC teams in China. This all contributes to our mission of connecting students through STEM across the world.

Describe your community along with how your team addresses its unique opportunities and circumstances.

Our team is located in a well developed area of Sydney where we continually assist more than 40 robotics teams. We promote STEM by hosting competitions, camps, robot demos and workshops. As part of a resourceful school, 4613 has brought robotics to disadvantaged communities in South Africa, Brazil and the indigenous community in our school's remote campus of Darkinjung. Our K-6 robotics program now also houses 160 children. We have also implemented robotics into the IST curriculum.

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?

4613 achieves real connection by building deep relationships with all teams we partner with, focusing on sustainable impact. In 2018 we hosted Chinese teams during build season guiding their design and manufacturing through intensive training. The integration of Brazilian interns from 1772 into our team during 2019, fostered dynamic growth between our teams. We have seen our South African team grow and develop from the first team in the continent, to one of the leading rookie teams in the world.

Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.

Our team culture promotes supporting members of the community in both planned and impromptu situations. As an example of this ethos, in 2019 our team members Tom and Lucas took the initiative to identify a struggling outback Australian team, finding time in between matches to troubleshoot and remediate their issues, ensuring a rewarding experience for all. In light of shipment delays from coronavirus, our students manufactured and distributed replica FTC game pieces to local teams.

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

We invited 2 members of 1772 to be part of our build season, where we designed, built and provided parts for the chassis before shipping it to them. In 2020, we evolved the structure of 7523 to increase internal sustainability, which ultimately worked, as their resilient attitude allowed them to continue through COVID. We have started 4 FRC teams, 5800, 6902, 7033 and 7523 in Brazil and South Africa. Since 2016, our team has also travelled to China, Qatar and India to assist numerous teams.

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?

The mentoring of skills for teams in Brazil, China, and South Africa online and in person has raised STEM innovators outside of Australia. We donated 15 iPads and 20 FLL kits to Brazil that are used in 4 different states, as well as in Argentina in workshops attended by over 500 students.Our robot camps and robotics program for years K-6 also integrate STEM into our younger community. By presenting to over 10000 educators at education conference Edutech, we increase the reach of STEM education.

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

Our partnership with the China Urban Youth Robotics Alliance (CUYRA) and FIRST China has facilitated sending students and mentors to China to bring skills to a rapidly growing FIRST community. We've run workshops for Chinese rookie teams annually since 2015 in 5 different provinces, and in 2018 we hosted 2 Chinese schools during the build season. Furthermore, we've joined with 1772 to create 3 new teams in Brazil and run more than 20 STEM workshops across South America.

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

Barker Redbacks upholds a welcoming community, nurturing all students of different abilities. Our philosophy is based on providing equal opportunities for everyone. In our school's remote Indigenous campus Darkinjung, we integrated robotics into their school curriculum and ran a competition hosted on their campus in December 2020. Additionally, we support and assist all-girls teams in the Australian FIRST community such as 4802 Blacktown Girls, 5876 Abbotsleigh and 6510 Pymble Ladies College.

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

We ensure sustainability in our outreach program by driving our newly started teams to forge their own relationships with stakeholders in their local communities, in addition to our partners. An example of this is team 7523, who now derive more than half of their support from local companies they made contact with, such as PROMMAC and CG. Our continuum of robotics from grades 1 through to 12 keeps students engaged, which along with high alumni retention as mentors ensures long term viability.

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

Enabled by our long-term sponsors, Barker College, IFI and CUYRA, we focus our efforts on building partnerships for newly created teams. Working with 3M, Dow and AIDTEC, we have started teams 5800, 6902, 7033 & 7523. Moreover, with our sponsor IFI we run summer camps, tournaments and scrimmages for schools in our community and around the country. Annually we host 3 state-level events involving 100s of students across primary and secondary school and support the running of National competitions.

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

As our school is transitioning to a fully coeducational program, we are working to integrate more girls into our team (currently 21%). To accomplish this we've started to promote robotics in information evenings and to include the robotics lab in school tours. We've also launched a pre-season working bee for new female students, to help them feel confident and engaged within the team. With these initiatives we hope to cultivate further girls' participation in the team.

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

4613 has immersed students in STEM through a robotics program that extends to all areas of our school and beyond. Our FRC team inspires and becomes mentors for the younger years, and allows them to strive for a higher understanding of STEM skills. Through this, students meet other like minded students and mentors who share the same passion for FIRST, further expanding their interests. Our internal and external programs also help to build a young generation of science and technology innovators.

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.

To ensure the continuity of our mission through the COVID-19 situation, we developed a system for the online delivery of

robotics involving OneNote & Zoom. While we are now in the fortunate position of being able to operate in person, our affiliated teams in Brazil are still using this system to deliver their program. As an aside, we investigated the demand for COVID response products with our local authorities, but thankfully they were never necessary.

Essay

Nothing about this season was normal. But during this uncertain time, the Barker Redbacks chose to sustain the change we sought to nurture in previous years. As the world began to adjust to a new normal, not only did we support teams within our local community but we also simultaneously increased our support globally, looking to ensure sustainability. We also began to look internally to grow our presence in our own school community while continuing to foster our strong connections beyond our school gates.

Our robotics program started in a garage in 2013 but now it engages over 250 students annually from Years 1 to 12, in 10 FLL Jr teams, 2 FLL teams, 7 FTC teams and 1 FRC team. In the wake of the FRC cancellations, we took the opportunity to establish an FLL Jr program and expand our FTC program with 3 new teams, providing students across the school with the ability to enhance their skills and remain engaged.

In 2020, 4613 accomplished one of our long term initiatives of introducing robotics to one of our school's rural Indigenous campuses, Darkinjung. We succeeded in integrating robotics into their curriculum, making STEM accessible and visible where it wasn't before. Even in a difficult year, where postponing or even cancelling this project may have been a more plausible option, we not only finished our task but we succeeded in achieving our ultimate objective of perpetuating change. The Redbacks are excited to extend our innovative robotics program into other Indigenous campuses and communities in the year ahead.

4613 prides ourselves in our passion for STEM culture and we are committed to spreading its influence in places beyond the robotics lab. Working with our school, the Barker Redbacks were instrumental in the creation of the subject, iSTEAM in Years 9 & 10. Through our efforts, robotics has also now become a compulsory subject in our Junior School, with students being taught critical skills that inspire FLL and FTC participation. Students tackle real world problems and apply maths, science and engineering to find innovative solutions, preparing students for an increasingly STEM-driven future.

To ensure other schools, students and educators can also benefit from our experience in STEM education, the Redbacks present at EduTech, the largest education conference in the Southern Hemisphere. Since 2017, 4613 has delivered presentations to over 10 000 participants, allowing these educators to integrate STEM and Robotics into their communities and schools around the world. Additionally, to help teams understand pneumatics and fabrication, we delivered several workshops which were broadcast on the FIRST Australia YouTube channel and also presented on 24 hours of STEM and Stuy Splash from Team 694.

To further help the community beyond our school gates, we host an annual FRC and FTC Week 0 scrimmage that acts as practice before the competition day. By providing a field and competition environment, it aims to give teams both locally and around Australia the opportunity to assess how their robots perform in game, giving them an opportunity to bring their best. We help teams to identify how they can improve their mechanical, programming and strategy skills, allowing them to adjust and change different aspects of their robot before the high pressure environment of a competition.

We've also built a significant online presence, with our "Robot Reveal Videos" for FRC and FTC attracting nearly 300,000 YouTube views from members of the public across the world. Mentioned by many high-profile news organisations such as The Daily Telegraph, the Sydney Morning Herald, SBS, and the ABC, we've broadcast the constructive work that our team vision has accomplished since its inception. SBS has praised our school and our robotics program for we prepare students for the 'jobs of the future', while the Sydney Morning Herald has applauded the works of our alumni, such as Oliver Nicholls who won the International Science and Engineering Fair in Pennsylvania, as well as many other students who have won accolades such as BHP Billiton Foundation Engineering Award. In the future, we hope our online presence will continue to educate and inspire teams around the globe.

In addition to providing knowledge and expertise to teams worldwide, we have also created 4 teams internationally. Identifying that many Brazilian teams had become inactive due to the lack of a national competition following the Global Financial Crisis in 2008, we joined with Team 1772 The Brazilian Trail Blazers in 2016 to create Team 5800 Magic Island Robotics, the first new Brazilian FRC team since 2009. We then followed this up with the creation of two more Brazilian Teams, 6902 STRIKE and 7033 Roosters in 2018. Since their creation, we've worked with these teams to gain sponsorships and ensure that they are secure and self-sufficient, and continue to support them by providing regular mentoring, part supply, team member hosting and online assistance through the pandemic.

Essay - page 2

Additionally, in the 2018 offseason we created Team 7523 SpringBots, the very first African FRC team. This was the culmination of months of planning and consultation across five countries, to ascertain where a program would be most sustainable. We partnered them with the DOW Foundation, subsidising their costs of participation in FRC. Additionally, in collaboration with the Brazilian non-profit organisation AIDTEC, we enabled one of 1772's senior mentors to spend Build Season with them in Africa. This allowed the team to have a smooth introduction into the technical and non technical areas of FIRST.

7523 had an amazing first season, winning the Rookie All Star Award in the Southern Cross Regional, during which we hosted the team. Later that year, they also won the Rookie Inspiration at the Detroit World Championships. Their impact in their region has exceeded all expectations. In 2019, the SpringBots met the president of South Africa, Cyril Ramaphosa, and represented the STEM movement at the State of the Nation Address, reaching hundreds of thousands of people across the country. Later that year, we supplied them with the field and supported them to host the first offseason FTC event in South Africa, when we invited the FIRST global teams in the area to play FTC Rover Ruckus. Since then, we have continued to advise them on the day-to-day operation of the team and have had the privilege to witness them grow as a team.

To continue sustaining our global impact, the Redbacks visited the newly created Qatar FIRST Global Team in 2018. During our time there, we shared our programming and mechanical expertise to mentor and grow their skills in these areas. Building on the knowledge that they gained, they continued to expand and have since participated in multiple competitions. It delights all of us to see the success of their team.

Our active participation in the growth of China's Robotics Program and competitions since 2015 has led to our relationship with the nation only growing closer, as we continue to nurture and build up the future leaders of STEM in China. Over a collective 9 weeks we've supported over 50 rookie teams, helping to grow mechanical and programming skills. Our efforts have been fruitful, with China having hosted their first official FRC regional in 2017, and planned multiple events before being affected by the pandemic in 2020. In 2018, 4613 also hosted students from 2 chinese schools (Teams 6941 and 7586), who eagerly participated, learned and engaged with our design processes. By providing workshops in different technical fields, the students returned to China not just having learnt how to independently manufacture their own robots within 2 weeks but as leaders of their respective teams, ready to invigorate China's STEM culture.

Together, we are passionate about guiding, assisting and advising newly created teams. In 2019, one of our alumni travelled to China to mentor their first all-girls team 7529, FRC Team Mulan. His 7 weeks present in their labs and overseas endeavours, developed their skills exponentially and earned them the Rookie All Star Award that year. We strongly believe in an equal representation of women and men in STEM-related industries, so we were honoured to play a role in inspiring a new generation of STEM innovators.

Creating change is a hard feat, but sustaining it is another. From our formation in that famous garage 8 years ago to now, we have made it our mission to ensure STEM education and FIRST reaches as much of the world as possible. By continuously helping, supporting and sustaining teams in our local community, Australia and nations around the globe, we have transformed schools, organisations and sometimes even entire communities. From engaging people in our local area and Indigenous communities further afield to creating and supporting teams in Brazil and South Africa, to aiding the growth of many teams in China, we will never stop pursuing our ultimate goal to spread STEM and FIRST around the world.