Chairman's Award - Team 5985

Print Close

2022 - Team 5985

Team Number

5985

Team Nickname

Project Bucephalus

Team Location

Wollongong, 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.

Limits overcome, skills expanded and opportunities explored. Statistics from the last 3 years show that for 5985, FIRST is a: -Community: 73 members from 22 schools in 3 countries -Passion: 72% in multiple programs -Dedication: 43% mentoring FIRST teams -Future: 100% planning tertiary education and 95% seeking STEM careers -Legacy: 48% of alumni returning as mentors -Pathway: 100% of alumni in tertiary education or STEM careers -Journey: an average FIRST career of 5 years, starting from age 6

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

PB's home is Wollongong (pop. 307,000). Between rural and urban, a declining steel industry adds to restricted funding. Here, PB has built: -A system organising STEM grants and equipment for 27 schools and FIRST teams -A major FIRST Hub accessible to rural teams, with a robust FLLC community of 183 teams (70% mentored by PB) -A teaching network active in 41% of city schools -A business model catering to locals and tourists -A diverse team including homeschool (18%) and low-income (30%) families

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?

PB's Teaching Program funds the team and inspires youth to engage with STEM and FIRST. 3 years of statistics show the impact: -Run year-round for 2,371 children in 28 venues and online. Engaged students attend for up to 7 years, whilst 88% of PB members learn to teach -Unique incentive from PB has seen 39% of students use personal robotics kits, freeing PB resources for 16 new locations -Students are engaged by 65 PB-designed robotics challenges, including 5:1 scale FRC games for LEGO robots!

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

GP is built into PB culture. Over 3 years, members have: -Taught in 2,117 hrs of STEM classes, representing FIRST to students and inspiring 7583's partner program -Volunteered at 44 in-person and remote global FIRST Events -Fixed dropped robots and calmed panicked teams at 10 FLL events -Built a new competition robot with 7707 while theirs was stuck in Customs - Modelled coopertition at 11 FRC events with a scouting project requiring multi-team collaboration and data sharing, even in opposition

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

PB builds teams worldwide. Over 3 years PB has: -Assisted teams via 29 published resources, 5 official programs and 7 Kickoff events -Started 15 FLLE teams through My Maker's Space in the USA -Started 23 and mentored 50 FLLC teams globally in the Teaching Program, donating LEGO to 12 -Started 6 FTC teams, aided their outreach and spoke at 2 international conferences -Created 2 FRC initiatives teaching strategy and GP to 12+ teams from 2 countries -Started 3 FRC teams, 2 during COVID!

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 3 years, PB's STEM opportunities have: -Reached 21 schools and libraries via weekly classes for all skill levels, growing attendance 40% and female participation to 32% -Engaged all ages in 200hrs of display -Formed Australia's first SWENext club, connecting 16 girls with international experts -Produced middle-schools CAD lessons, used to train 17 PB recruits -Built a Scouts Australia STEM program, reaching 80 youth in a National activity format -Run classes in 7 special education schools

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

PB thrives on collaboration. 2022 marks: -7 yrs bringing STEM to rural areas with the University of Wollongong -7 yrs delivering 2 STEM programs with the Rotary Club of Corrimal -5 yrs teaching design and creating resources for IronCAD -5 yrs mentoring 7583 and 6035, donating space and building an integrated STEM program -3 yrs promoting tertiary education with TAFE NSW to 1,167 students, creating a shared workspace for FIRST teams -1 yr providing female STEM programs with Propel Technologies

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

PB strives for accessibility, 3 years of efforts include: -Gaining 49% female membership -A free all-girl STEM program for 147 girls, reaching refugee families and starting 3 FLL teams -Remaining financially accessible. 88% of PB teach in lieu of fees -Government accredited funding programs providing 476 students access PB classes -Providing educational and vocational STEM training to 152 youth and adults with disabilities -Engaging ages 3-109 in STEM with visits to preschools and nursing homes

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

PB and its projects endure because of the Teaching Program: -Financially, it provides 93% of team income. This grants stability and absorbs risk of new projects. A COVID-Safe rating and integration with government programs gives security -Structurally, it provides flexibility and removes reliance on others. Classes are easily started, stopped or moved. PB welcomed 3 new host schools in 2022 -Socially, it provides community visibility, free student access to FRC and a pathway for 80% of recruits

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

PB has seen 56% sponsor growth in 3 years, building partnerships that include: -special access to season insights in a Build Blog -award plaques featuring "used" FRC Game pieces -running robotics classes for sponsor employees/members -creating excitement at sponsor events, such as robots dancing at K-6 discos -protecting property, even finding and fighting a school fire! 70% of sponsors met PB via the Teaching Program, engaged by team members and class quality - and the fun had by children!

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

PB struggles with material management. Financial limits require the team to recycle every possible component each year. This mindset also led to build-up of "Useful" material, causing hazards and wasted space. The absence of accessible "practical history" has negatively impacted robot development and made it harder for new recruits to learn from past mistakes. PB is already making changes by: -Electing quartermasters -Creating a storeroom indexing system -Visual documentation of system testing

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

PB has 3 main goals: -Make robotics a familiar activity. PB classes are highly visible and connect 250+ students a week with STEM -Create opportunities for all. A chance to engage is a prelude to being a STEM leader! PB's program for children with disabilities has reached 132 students since 2020 -Build leaders, creators and thinkers. PB teaches robotics, but also collaboration, patience and more. Health providers fund student access to PB programs for practical Life Skills and STEM learning

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.

Independent, self-sufficient and accessible, PB: -Members travel up to 120km to meet -Treasure their oldest fans in the IRT nursing home -Is vital to FIRST Australia's COVID response, running a national FRC webinar series and supporting 2 global 24hrs of STEM events -Kept Wollongong FLLC alive in COVID, delivering tables and gear door-to-door -Turned a disused function centre into workspace for 13 FLLC and 3 FRC teams A PB member was Wollongong's Young Citizen of the Year for work in robotics!

Essay

"Oh, the Places you'll go" sums up the spirit of 5985 Project Bucephalus (PB). The vision to Create Opportunity, Transform the Community has led the team from beaches to the bush and preschools to nursing homes - opening pathways for others along the way. These travels have been sustained by preparations made years before, enduring despite obstacles including the pandemic. The vibrant FIRST community in Wollongong is built on these journeys, which then go on to inspire the world.

You never know how life will go. If 2020 changed "normal", 2021 tested endurance. PB members in 3 countries switched between in-person and remote operations. 5985 stayed the course, harnessing communication, assets, and relationships with sponsors to run and expand programs. Meanwhile, PB maintained a government COVID-Safe rating, and recruited 14 students despite never meeting in person!

We never know the places we'll go. In 2015, PB's journey began with the Teaching Program. These team-run classes teach robotics to anyone, inspiring love for STEM and building life skills whilst generating income. All opportunity, outreach and growth start with this program. A PB class is in session every day of the school week, up to 220km from Wollongong.

The pre-COVID logistics are incredible: Each week PB travelled 500+km to reach 250+ students in 18 locations! In the pandemic, classes ran in 4 COVID-safe locations, reaching 150+ students in person - and 112 online classes reached around the globe! School holiday workshops allow the Teaching Program to run year round, reaching an extra 350+ students annually. The program caters to all ages, skill levels and learning styles, seamlessly merging newcomers and veterans.

PB extracts many opportunities from the Teaching Program. It roots PB in communities and grants self-sufficiency - in FY2021 it provided 93% of team funds. Expertise and financial stability form a vehicle to absorb the risk of launching new programs. Finally, it makes 5985 accessible: 81% of team members enrol as teachers in lieu of fees.

You never know who you'll take with you. PB is sewn into the community fabric. Over 7 years, team identity has been shared with 5,953 Australian students, enabling long view recruitment. STEM-minded students are identified early and introduced to FIRST. 80% of 5985 began their STEM journey in a PB robotics class. Stories like this define 5985:

Liz's passion for robotics was sparked in PB's FIRST Scouts program. Her leadership and talent was recognised by an invitation to join 5985. Liz took up the challenge and flourished - 3 years later she is an admired Safety Captain, team leader and STEM ambassador! Aiming for a STEM career, Liz now teaches robotics to children, as she was taught.

You never know how strong you'll grow. Sustained outreach, opportunity and impact has placed PB at the heart of FIRST in Australia and created a FIRST powerhouse on the South Coast. This passion transcends borders - particularly to the Quad Cities (QC) of Iowa and Illinois, USA. In 2020-21, despite COVID, PB equipment and volunteers globally supported 21 official FLL, FTC and FRC events.

FLL is a 5985 passion - 73% are Alumni. The team has transformed FLLC in Australia through outreach including extensive mentoring and creation of 4 official support programs. Pre-COVID, PB's FLLC Kickoff drew teams from 600+ km away. Now virtual, it reaches across Australia and overseas. PB kept FLLC alive in Wollongong in the 2021 lockdown: simultaneously mentoring 9 teams online and spending 25+ hours transporting tables and equipment to isolating team members. The Wollongong FLL Regional finished the season - run by PB as it has every year since its founding in 2015.

Since 2015, PB has mentored 219 FLLC teams globally (starting 120), including 70% of all South Coast teams. In the QC, 5985 brings FIRST to schools and communities, running displays, mentoring and assisting with grants. PB also created and runs the first FLLC/FLLE Joint Kickoff, reaching 140 QC teams since 2017.

Creating opportunities for all ages, PB started 89 FLLD/E teams, and runs an Expo at the Wollongong FLL Regional. In the QC, 42 FLLE teams have attended the joint kickoff since 2017. PB is truly proud of creating "My Maker's Space", an official season-in-a-day event that has served 92 marginalised QC youth since 2019.

5985 empowers FTC. Teams are invited to PB events to showcase and recruit, and PB members speak at coach conferences. During COVID, PB's experience in remote team management was vital: speaking at the online 2021 Canadian FTC Kick-Off and a Coach Professional Development conference spanning North America. PB also planned and assisted an FTC Kick-Off in Illinois and mentored 9 FTC teams (starting 8) in Iowa - 8813 being mentored year-round. In Australia, PB hosted and ran an FTC scrimmage for 10 teams in 2021.

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From the USA and Australia, PB has reached Africa, Asia and Europe. NXT kits restored by 5985 were taken to schools in Tanzania, Ethiopia and Kenya - team members starting FIRST in the latter. In 2021, PB started the first FLL teams in Mauritania. In China, PB mentored and competed with 3 rookie FRC teams and in 2020 ran online FLLC classes for rural schools. In Germany, PB has spent 3 years mentoring 4 FLLC teams.

You never know what your work will grow. Lack of community resources create PB's greatest challenge: starting FRC Teams. Thus, initial focus was on partnerships with existing teams. 5985 shares space and knowledge, running FRC scrimmages and National Webinars. The team moderates and speaks at Mentors Without Borders and 24 Hrs of STEM, and has assisted teams globally in the Compass Alliance Call Centre since 2019. Ultimately, 5985 created 2 programs: The South Coast Alliance (SCA) and the Collaborative Scouting Project (CSP).

Currently a collaboration of 7 FRC teams, the SCA was founded by 5985, 6035 and 5988. Through the SCA, PB shares their field, saved 6035 from collapse and helped 7583 start a teaching program complementing PB's. 5985 welcomed 7583 and 6035 into the workshop when they lost their workspaces - 3 teams sharing space since 2020.

The CSP embodies Coopertition and teaches strategy. It builds alliances that share scouting, data and analysis - even in opposition! The basic design of 2017 led to an annual enterprise with PB leading 12+ international teams to produce a system for FRC events worldwide (adding FTC in 2020).

Persistence in laying pathways for FRC teams saw PB start 7583 in 2019 and 8259 in 2020. Validating PB's passion, both teams had roots in FLL outreach. The greatest victory came in 2022: the "Unstoppable" program and starting 8844.

Sometimes you'll see how powerful you can be! "Unstoppable" came from years of hard work with the Dept. of Education and Disability Service Providers. The target is Flametree: a Special Education high-school for high-risk students - 52% involved with the Justice System, 100% with backgrounds of trauma, abuse and neglect. PB built 8844 from scratch, obtaining $21,000 in grants and inspiring students. At Flametree, lost possibilities are being brought back into reach.

"Unstoppable" came from "Unlimited", an older 5985 program designed to reach beyond traditional STEM audiences. In 3 years, PB has spoken at conferences, visited nursing homes and pre-schools, taught at autism spectrum schools and delivered vocational training to adults with disabilities. A 2020 Government grant of $125K expanded the program to weekly STEM classes for children with disabilities - reaching 132 students and 7 schools so far. PB's COVID-safe record factored heavily in receiving the grant.

PB programs fill gaps and reach those often missed. "Rocketing Girls Into Robotics" is a free all-girls STEM program in its 5th year. Funded by Government grants and sponsors, it produces FLLC teams, FRC recruits and focuses on students from refugee, indigenous, and low-income backgrounds. PB also founded the first Australian SWENext Club in 2020, an international STEM group linking girls with female engineers. Smaller programs run for rural and exchange students. Community roots see PB invited to events like the Comic Gong convention and Australia Day festivities, each reaching 18,000+ people. 5985 itself is accessible, with female membership at 49% and over 50% with diagnosed physical, mental or emotional challenges.

You never know how things will go. Opportunities are valuable, sought before financial aid in PB partnerships. TAFE NSW (Technical and Further Education) is PB's major partner, donating use of a building in 2020 in return for PB running youth STEM opportunities on campus. In three years, a disused function centre has been transformed into a multi-team workspace, used to run scrimmages, FLL Regionals and robotics classes. It became a COVID-safe location for 16 FIRST teams, allowing them to thrive despite the pandemic.

Partnerships can deliver unexpected opportunities - such as 5985 rescuing the 2022 FRC Regional in Australia! When problems arose with the usual Sydney venue, PB stepped in with a competition-ready alternative in Wollongong, joining the Regional Planning Committee and supporting the event. Lobbying government and community groups, PB promoted the value of the opportunity and arranged discounted accommodation, funding from tourism boards, and a team social night. This was possible due to a partnership forged in 2020 when PB and the WIN Entertainment Centre planned an FRC tournament as part of a technology festival. COVID cancelled the event, but the plans were ready to be dusted off two years later.

At the heart of FIRST in Australia, 5985 forges pathways to unreachable possibilities. Radiating from Wollongong, a growing network of opportunities reaches communities around the world. Year-to-year PB works to fill the gaps, reaching anyone regardless of age, gender, ability, skill or location - because once an opportunity is grasped, you never know the places you'll go.