

## FIRST Impact Award - Team 5587

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| <b>2023 - Team 5587</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Team Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>5587</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Team Nickname</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Titan Robotics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Team Location</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Alexandria, VA - USA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>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.</b>                                                                                                                                                                                                                                        |
| Titan Robotics prepares students for college & a future in STEM by laying the groundwork for technological & workplace skills. Our alumni have helped new grads land exclusive internship & scholarship opportunities for businesses on the frontier of innovation like SpaceX, Google, & Tesla. 100% of our Alumni have graduated high school & attend college, with 75% majoring in a STEM field. 19 alumni have returned to the team to contribute as mentors and volunteers at FIRST events.                      |
| <b>Describe your community along with how your team addresses its unique opportunities and circumstances.</b>                                                                                                                                                                                                                                                                                                                                                                                                         |
| Alexandria treasures its historic sites, local businesses, and its diverse community celebrating differences across cultures & identities. This is inherent in our student body from 119 different countries speaking 124 languages, & socioeconomically, as 60% of students qualify for free/reduced lunch. Partnering with local restaurants provides meals for the team & ensures our members are well-fed. Our \$0 entry fee and no application process allows anyone to join and inspired our camp scholarships. |
| <b>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?</b>                                                                                                                                                                                                                                                                                                           |
| We collaborate with the schools in our district to initiate robotics teams & clubs at all levels. In the past 3 years, we've supported 28 FIRST teams, 27 of which we established. Since our schools reopened, we've helped restart elementary & middle school programs by providing funding & mentoring. In doing so, we foster a pipeline in STEM from elementary to high school. Today we see significant growth in our K-8 programs & our digital and in-person summer camp participation & 1 new STEM club.      |
| <b>Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.</b>                                                                                                                                                                                                                                                                                                                                                                     |
| Titan Robotics has organized events with other NoVA FRC teams & created a NoVA Alliance with FRC 4472 & 8230 as a way to support each other. We host kickoff, summer camps, and scrimmages for our FLL teams to prepare them for competition & learn Gracious Professionalism & Coopertition. Our team is                                                                                                                                                                                                             |

a strong presence in our community, attending city events such as Art on the Avenue, First Thursdays, STEAM Nights, & Spirit Days. Our members give back to the FIRST community as event volunteers.

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

Post-pandemic, 1 K-8 team remained. Since then, Titan Robotics started & sustained 27 new teams with local schools. To ensure their longevity, we supply student mentors, grant funding, host shop tours, & mock competitions. Through our aid, we ensure teams can focus on growth and student learning and not registration costs. We make a conscious effort to encourage their independence and avoid influencing team decisions so they may develop their own culture & identity.

**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?**

This past summer, we offered 4 weeks of summer camps to 47 K-9 students & introduced them to physics, engineering, programming, robotics, & problem solving through our homemade curriculum. Our team has impacted upwards of 2.5k students through 16 outreach events since last May, including teaching 300 elementary students principles of code with our robot. We've partnered with Virginia NIH AIM AHEAD by providing mentoring, logistical, & activity planning to help construct their STEM youth program.

**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**

We work with local restaurants to donate meals during the season & sponsors to provide funding. Building Momentum provided training & workspace during the pandemic and continues to; with an employee mentor joining our team & 501c3 board. This summer we volunteered with our fellow CHS Chairman's finalists to swap outreach ideas and promote More Than Robots to lawmakers at The US Navy Memorial. Within our school district, we work to oversee 4 K-8 & 24 FLL teams, & 6 K-8 STEM Nights.

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

Our team fosters an inclusive environment with a welcoming & accepting space. The team has a "no cuts, no fees, & no experience required" policy, that also allows flexible attendance. This removes any barriers that may limit students from joining. With more than half of our leadership identifying as non-male & 68% of members identifying as LGBTQ+, we value respecting others' identities, expressions, & opinions. We recently partnered with LGBTQ+ of FIRST to continue advocacy for our members.

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

We ensure an effective pipeline for future growth by creating & mentoring FLL & FTC teams. As a result, we observe a greater interest in STEM at the high school level & more students coming by our workshop. Presently, 33% of our members were on a previous FIRST team. We maintain a close relationship with school administrators, who promote the team and ensure we will have our workshop for seasons to come. Grant funding guarantees financial stability for our FRC and FLL teams.

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

To ensure our team's sustainability, we tap into our mentors' professional contacts and train our members in grant writing. We've continued our tier based donation system to show our gratitude for our sponsors from local businesses to Fortune 500 companies. All sponsors receive a t-shirt, letter of appreciation, and social media shoutouts. Select sponsor's logos are displayed on our website and robot. Sponsors are also invited to our shop for tours and we offer robot demos.

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

A recent issue has been securing sustained team member interest. Our "no cuts, no fees, no experience" policy attracts students but the conversion to members is low. It is a large investment of current members to provide engineering and business skills to these students. To sustain engagement with new members, we require a minimum of 15 technical and nontechnical hours to attend competition. This policy is time and resource intensive for veteran members but builds a multifaceted team.

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

As a nonprofit STEM youth organization, we prioritize outreach to our community by creating STEM enrichment programs that are accessible, engaging, and long-lasting. We've restarted our summer camps for K-9 students, marketed across the city, and offered scholarships based on financial need. We revitalize younger FIRST teams, and partner with schools & organizations like AIM AHEAD to establish their own programs. This year, our members have spent 774 hours aiding in our outreach initiatives.

**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.**

Our members are encouraged to explore and move between subteams, allowing them to learn skills across subjects and in all aspects of robotics and business. This applies to our team's leadership as well: our leaders are democratically elected at the end of the season, allowing anyone to run. Our team has a few unique traditions such as showing our spirit at competitions with tutus, curated shop music, and our annual honey roast, where we compliment our peers on their work during the season.

## **Essay**

Introduction Team 5587, Titan Robotics, was established in 2015 and has since maintained our mission of providing STEAM resources to the community. Our team is based out of Alexandria City High School

in Alexandria, Virginia. As the only public 9-12 high school in the city, the school has a large and diverse student body and is the center of our community. We have become a resource for our school district, providing STEAM-related education and resources to our local elementary and middle schools. We prioritize equity and diversity on our team, and provide an accessible workspace and inclusive work environment. Titan Robotics is a student-led team focused on enhancing STEAM education in our schools by following the principles of FIRST. Our team is composed of around 30 students, 68% underclassmen, and 15 mentors. Among our mentors are some parents who provide meals and supervision. This structure allows for students to have an intense, hands-on, collaborative experience. At the end of each season, new leads are democratically elected. By having a democratic election anyone can have the opportunity to be in leadership. Transparency between the team's leadership and members is shown through open communication, discussing the team's schedule and plans. Currently, three members of leadership, including our president, were previously on the Future Titan Robotics Team displaying a visual example of our pipeline in action. With more than half of our leadership not identifying as male, our team provides equal opportunities to a diverse group of students. In addition, we prioritize non-technical and technical subteams equally. Typically, we have a similar number of students working on grants, social media posts, event preparation, and more, as we do working on our robot. We encourage subteam flexibility, allowing members to work on what inspires them, encouraging our members to build a vast range of applicable skills, like communication and collaboration. Our vision is to spread STEAM skills to all in our community and build future leaders in STEAM regardless of race, gender, or economic status by introducing them to, and supporting FIRST participation. At our high school, there are 119 countries and 124 languages represented with a student body composed of a non-white majority. We break down barriers by creating and funding new K-8 teams at local schools. There is a wide socioeconomic range in our community and more than half the student body at ACHS qualifies for free and reduced price lunch. To keep our team accessible to everyone regardless of their economic status, we supply meals, avoid fees, and allow for flexible attendance.

Community Titan Robotics works closely with local businesses to create beneficial partnerships. During the pandemic, we connected with Building Momentum, a training and education company for the community. They allowed us the room we needed to manufacture our robot, as well as provided technical training to our members. We continue to have a good relationship with the employees and some of our students have been employed in the summers there. This year, we are partnering with AIM AHEAD, a NIH fellowship grant program particularly focused on providing equal opportunities for minorities in health sciences. We support this program by providing mentors, advice, and support for teachers to help them build a program optimized for students. Currently, we are planning a free health sciences camp available to all that will provide access to technology, such as augmented reality. We have also continued our partnership with Kiwanis Alexandria, a non-profit service organization that has provided our team with funding in years prior. This month we became a silver tier partner to the LGBTQ+ of FIRST organization. We will work with them to provide informational pamphlets and educational resources about their organization at competitions and events. In addition to our partnerships with other businesses, we established 28 FLL and FTC K-8 teams in our school district. Of these 28, twenty-seven have been created since the end of 2021. This year we have supplied over \$9K in funding to these teams, much of which was used to purchase materials needed to compete. In addition, we paid for registration costs for competitions when teams needed it. This year, the George Washington Prexies, an FLL team we mentor, attended the VA-DC Championship. Currently, over 70% of all ACPS students have access to a FIRST team. As our school system recovered from the pandemic we became a vital resource for teachers, parents, and several schools. For elementary and middle schools around us we provided STEAM enrichment resources necessary for hands-on STEAM learning experiences. This support includes

physical items such as Lego robotics kits and funding. We have taught 15 of our k-8 teams how to apply for grants and create their own websites. We have become a point of contact in our community for parents and teachers looking for STEAM help. Not only do we start our own teams we help other local STEAM startups as well. One of the middle schools created a health sciences program, however, it lacks the manpower to run smoothly. They reached out to Titan Robotics for volunteer mentors and advice on running an after school club and we graciously accepted the offer. We partner with other local FRC teams by hosting Kickoff at Building Momentum and inviting Koibots, Team 8230, to watch the game reveal and brainstorm strategy. Earlier this year, we created the Northern Virginia (NoVA) Alliance on Discord, inviting Koibots and SuperNOVA, Team 4472. This is a place where we discuss strategy, receive advice regarding technical and non-technical activities, and plan potential scrimmages. Since last April, our team has volunteered at and/or hosted 16 outreach events. Some notable events we attend annually are "Art on The Avenue" and "Spooky Science Night." Art on The Avenue is a local art festival that attracts thousands of tourists as well as locals every year. At this event, we show kids the importance of the A in STEAM with tessellation activities and "design your own robot kits." During the off-season we usually attend two competitions. This year we participated in FRC 449's Bunnybots competition and Battle of Baltimore. For these competitions we have a "hands-off seniors" approach so that new members can gain technical experience before the season begins.

**Team Growth** The 2022 FRC season was one of our most successful. We earned our first blue banner when we won a district competition and then went on to earn two more! At District Championships we won the Chairman's (now Impact) Award earning a spot at FIRST Championships. Winning the Chairman's Award was a huge, rewarding accomplishment for our team. It was gratifying to see all the work we have done in our community recognized. This was our second trip to FIRST Championships, the first was in 2019 for Deep Space. Titan Robotics was also honored with a House of Delegates Commendation from the Commonwealth of Virginia, that recognized our Chairman's Award achievement and the effort made by students to enhance STEAM education in our city. Last summer, we were able to hold in-person summer camps. Over the course of 4 weeks we introduced 47 campers, in grades k-9, to robotics, rocketry, physics, programming, problem-solving, critical-thinking, and communications skills. Counselors fostered an adaptable environment making sure every student was occupied regardless of experience level or accommodations. Through our camps, we are able to further integrate our team into the greater community of our city. Parents have since brought their students to our open house events and competitions. Our goal is to make our camps even more accessible by transitioning to a donation based or tier based pricing system so that cost is not a barrier. Currently, scholarships are available to any camper who may require financial aid. Last July, we were invited to a screening of the documentary, More Than Robots, for members of Congress and their staff, in Washington D.C. We talked to Members of Congress, Government Affairs Representatives, and FIRST VIP guests. We explained what FIRST means to us and how it has impacted our lives, and gave robot demonstrations. FIRST Founder Dean Kamen and CEO Chris Moore attended this event along with the directors and producers of the documentary.

Our Future in FIRST Titan Robotics has experienced improvement in every facet of our team. From exponential growth in our K-8 outreach program, specifically younger FIRST teams, to having a successful technical season. Members have gained irreplaceable experiences and important workplace skills, proving that FIRST really is more than robots. This allows us to focus on providing STEAM resources to every student in the community, inspiring future generations in FIRST. ;

