

## Chairman's Award - Team 1648

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2021 - Team 1648

**Team Number**

1648

**Team Nickname**

G3 Robotics

**Team Location**

Atlanta, Georgia - USA

**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.**

Our graduation rate is 100%, 30% higher than our school's, with a 99% rate of alumni attending college after high school. Team members have started clubs at Grady such as Mechanics Club, and joined existing clubs like Technology Student Association. Alumni have participated in college robotics, including Georgia Tech's RoboJackets and Off-Road clubs, and mentored G3 and other FRC teams (6177, 4941) after graduating. Our Lead Mentor was on G3 in high school and has now mentored us for 5 years.

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

Due to our location in the heart of Atlanta, it's important we provide financial aid for any G3 member who needs it. Since we don't receive funding from our school, these scholarships are possible thanks to generous sponsors and team fundraising. Additionally, due to COVID, we have not been able to meet in person since March 12, 2020. Though we had to alter the way we hold meetings, we haven't altered our outreach goals: despite COVID, we've still found new ways to give back to our community.

**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?**

Drones for Good (DFG) is our most sustainable outreach program, maintaining year-round interest in *FIRST* by accompanying FLL as an off-season competition program. This year, we also began our Engineering@Home initiative, which gives kids a chance to practice STEM concepts with biweekly engineering challenges posted to our social media and website. As we continue to pursue more ways to spread the *FIRST* message, we measure results with our Impact Spreadsheet, where we track the reach of events.

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

Inclusion is a vital part of G3, so we've developed initiatives such as Adaptive Maker Faires to make STEM more accessible to students with special needs. At FRC in 2020, Our Quiet Rooms (the first in GA) gave relief to many overwhelmed students. We also provided GeorgiaFIRST volunteers and 64 teams with information on how to recognize/support neurodivergent students. Finally, we've conducted multiple seminars at the GeorgiaFIRST Symposium to promote diversity throughout the *FIRST* community.

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

We started and continue to assist five FRC teams: - Atlanta Public Schools teams 1795, 5651, & 6177 - Community teams 6023 (DISCBOTS, a team of refugees) and 4941 We provide them financial support, parts/machinery, and transportation to competitions. We host annual FLL tournaments, assisting local teams by providing technical guidance and a place to compete. Last year, we also mentored two FLL teams from Grady's feeder middle school (12016 & 18703) at their after-school practices.

**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?**

Last year, we started working with a local homeless shelter called the Nicholas House, where we engaged students in STEM through coding and robot demos. We attend science nights at 4 local elementary schools, where we use similar demos as well as other activities to introduce STEM concepts to young people. Our DFG program also inspires young people to pursue STEM, including concepts that *FIRST* doesn't cover, like aviation. Many DFG alumni even go on to join G3.

**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**

Due to G3's close proximity to Georgia Tech, we maintain a close relationship with them. Many of our engineering mentors are Tech students, allowing G3 to access Tech machinery like waterjets and 3D printers. G3 also has a strong pipeline to Tech: ~80% of our 2020 alumni enrolled there, and some even joined clubs like RoboJackets and Off-Road. Additionally, our partnerships with the MDE School, FOCUS + Fragile Kids, and Grady special education help us grow and maintain our Special Needs Program.

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

G3 pursues many initiatives centered on welcoming diversity. We have tailored our recruitment process to be more inclusive and unbiased, resulting in the recruitment of 25 new POC, women, and students with disabilities. This led to more women in leadership, unique perspectives, and outreach in new directions such as our 2019 & 2020 GeorgiaFIRST Symposium presentations, which focused on special needs accessibility/inclusion and the experiences of students of color in *FIRST*, respectively.

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

G3 achieves sustainability through a robust student leadership structure that provides the necessary support to keep the team prospering, especially when we lack reliable teacher-coaches. Additionally, students have created resources such as business plans, style guides, and organized CAD databases so seniors can pass on their knowledge when they graduate. We also support our STEM ecosystem through FLL and DFG, which prepare young students, especially those in our feeders schools, for FRC.

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

We engage with our sponsors through social media and quarterly newsletters, where we express our gratitude for them and keep them updated on the happenings of the team. We also participate in their outreach events, such as Dematic *FIRST* Day and General Electric Day. Our Booster club enlists sponsors through grant-writing and team documentation; then, students take on the responsibility of engaging and retaining them.

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

Since our switch to fully-virtual due to COVID, it has been increasingly difficult to engage and incentivise members during meetings. To combat these new setbacks, we have been taking steps to increase student participation. For example, we place more emphasis on small-group engineering work to provide opportunities for connection and underclassman leadership. Additionally, we often encourage underclassmen to run team discussions, allowing them to learn leadership through experience.

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

In order to best embody the *FIRST* mission, we focus on sustained impact and engaging underserved audiences. To achieve the deepest impact, we work locally and maintain a constant presence in our community. This approach to the *FIRST* mission has resulted in programs like DFG, which helps to keep elementary and middle schoolers in Georgia involved in robotics year-round, and our work with local special needs and homeless communities who otherwise may not have been able to explore STEM.

**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.**

Students with special needs have faced unique challenges in adapting to remote learning. To aid in this process, G3 has

continued working on our outreach virtually, including creating the Engineering@Home initiative. In direct collaboration with the Grady special education program, G3 made this initiative fully accessible to them by packaging 8 individual kits at no cost to families, and personally delivering them to students' households.

## Essay

Team 1648, G3 Robotics is committed to creating a FIRST community where each student can reach their full potential. Through comprehensive initiatives that make a sustained impact, we work continuously towards a thriving STEM ecosystem. We prioritize underserved and vulnerable audiences, fill gaps in FIRST, and mobilize our local community with the ultimate goal of constructing equitable pathways into STEM.

### Accessibility and Inclusion

G3 believes that a strong STEM ecosystem must reach every corner of our community. Students with special needs have potential to make valuable contributions to FIRST and STEM, but are often left behind due to stigma and inaccessibility. To combat this inequity, we've pioneered a series of programs to integrate this audience with enormous untapped potential into STEM and FIRST. Across our initiatives, we've directly engaged 200+ special needs families and 80+ FIRST teams.

Our program began in 2018 with our first Adaptive Maker Faire (AMF), an event with STEM stations that work with children's sensory, communicative, and mobility needs. We coordinated partnerships with the MDE School, FOCUS + Fragile Kids, and a special needs FLL team, the Dancing Bears (#46035). Across 4 AMFs, we've served ~100 people and engaged ~50 volunteers. A participant's mother even said she planned to enroll her son in STEM classes because he was so excited about our activities.

Prior to these events, we worked with special education teachers to design a comprehensive training guide outlining communication, privacy, and respect, ensuring that every volunteer is prepared to work with students with special needs.

G3 then started Classroom STEM Lessons, because typical special education curricula don't provide nearly enough exposure to STEM. Pre-COVID, we held monthly sessions in Grady's special education classes to introduce STEM concepts, such as teaching electronics using Snap Circuits and programming using Scratch. We've brought accessible STEM activities to other community events too: we led engineering projects at the Georgia Race for Autism, assisted athletes at the APS Special Olympics, and provided resources at the FOCUS Education Conference, reaching ~3000 people combined.

G3 also brought our commitment to accessibility into FIRST. At the 2019 GeorgiaFIRST Symposium, we taught strategies for accessibility and explained how integrating special needs members onto FRC teams exemplifies FIRST Core Values.

The stressful environment of FRC is overwhelming for many participants, especially those with special needs/mental health conditions. Therefore, we provided much-needed respite by implementing Quiet Rooms at every PCH FRC event in 2020 (pre-COVID), the first of their kind in GA. We petitioned GeorgiaFIRST, who approved it, and then we spent the school year securing funding, materials, and personnel.

Our message of inclusivity permeated through each level of the 2020 PCH competitions. We gave information about the Quiet Rooms to all 64 teams who competed, including tips on engaging with students with special needs. GeorgiaFIRST then distributed G3's training guides to their own FRC volunteers to teach them how to work with these students.

Throughout COVID, we've continued to serve this community through our new Engineering@Home program. On our social media, we post biweekly STEM challenges that use common household objects and suit a wide range of abilities. To make these challenges truly accessible, in 2021 we made home deliveries of 8 fully-stocked activity kits to Grady special education families at no cost. We also participated in the virtual FOCUS Education Conference, reaching 600 families across GA.

We believe in equal access to STEM and FIRST because everyone has something valuable to contribute to the conversation. Through our special needs programs, we ensure our STEM ecosystem is accessible and beneficial for all.

### Sustainability and Reach

As an established FRC team in GA, we see it as our duty to use our resources to spread FIRST throughout our state. We started and continue to support 5 FRC teams (1795, 4941, 5651, 6023, and 6177), and we've inspired our alumni to give back: 3 past leaders currently mentor 6177, and 2 have mentored 4941.

Pre-COVID, G3 mentored FLL Teams 12016 & 18703 weekly. We also ran triple annual FLL tournaments for 14 years, where G3 members refereed, MC'd, and coordinated volunteers while mentors and parents served as judges.

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However, we observed that many FLL participants lost interest in FIRST between competition seasons. So since 2014, G3 has filled this gap with our competitive drones program, Drones for Good (DFG). Just like FLL, DFG includes a Kickoff, Build Season, competitions, and judged awards that are developed and run by G3 members. We run DFG in FLL's off-season, allowing youth robotics programs to keep students engaged year-round.

DFG is critical to our local STEM ecosystem. On average, 40 teams compete each season, and G3 members contribute ~700 annual volunteer hours to DFG. To support teams year-round, we run weekend Flight Checks where our "Drone Doctors" assist teams in flying, programming, and building.

Throughout COVID, we've worked actively to host online DFG competitions and Drone Doctor sessions. To allow for remote, safe participation, we created individual flight test kits and obstacles that can be assembled fully at home. Furthering accessibility, teams are now allowed to reuse their drones from last year's season. This year's competition season will be completely virtual: each team will film their drone navigating the obstacle course and send it to G3 for judging.

Volunteering is a cornerstone of our STEM ecosystem; it's how we connect with our team and community. All G3 members volunteer at FLL and DFG tournaments, as well as our biannual Gaming Gauntlet, G5. Due to COVID, we held 2 virtual G5s this year and will continue until we can safely hold them in-person. Our Spring 2020 G5 was our first virtual COVID initiative, and despite the circumstances, we quickly adapted to an online setting to host the event. Players from FRC teams across GA joined in, allowing for friendly competition and FIRST interconnectedness in the wake of COVID isolation.

Pre-COVID, we went where FRC teams aren't expected, like building houses for disadvantaged families with Habitat for Humanity, representing the planet Mars in the ASF Race Through Space 5K, and marshaling for the Little 5 Points Halloween Parade. We also participate in numerous community partner events each semester, such as Coca-Cola STEM Day, NCR Community Partners Day, and Dematic FIRST Day.

We've participated in ~90 outreach events throughout the past 3 years. In 2019 and 2020 combined, we attended 52 outreach events, impacted 16,156 people, and contributed 3,081 total volunteer hours, excluding countless hours of preparation. Our longstanding commitment to community service is as important to us as building robots.

### Diversity and Equity

At G3's core, we believe that inclusion, integrity, and accessible opportunities for all are vital to our STEM ecosystem. That's why we pursue many initiatives centered on welcoming diversity on our team, in FIRST, and in the broader world of STEM.

Our commitment to equity begins in our own recruitment process. Prior to 2019, G3 recruited through 1-day tryouts; but these essentially select based on first impressions, allowing significant room for bias. We now use Provisional Membership, where we give recruits 3 weeks to see how they function on G3. Making our recruitment process truly inclusive has directly increased our diversity: in just 2 years, we've recruited 25 new POC, women, and students with disabilities.

G3 is committed to making FIRST available to any Grady student regardless of financial situation. During FRC season, we offer full and partial scholarships to all students who can't afford team dues or competition travel. This policy means that no student will miss out on FIRST due to financial factors out of their control—which is central to our team's mission.

These values have also led us to pursue outreach in new directions, such as our presentation this year at the GeorgiaFIRST Symposium, a panel about the experiences of students of color in FRC. We brought on panelists from EVE Robotics (6023) and DISCBOTS (7514), who shared insightful, eye-opening perspectives.

G3 uses our resources to serve disadvantaged students. We hold a strong connection with the Nicholas House, a local homeless shelter for children with turbulent living situations. This initiative was started in 2019 by one of our then-rookies. Our team worked directly with children at the shelter, allowing them to test-drive our robot and experiment with coding. We talked about STEM and introduced the children to Snap Circuits, which we later donated. Through our visits to the Nicholas House, we work to extend the FIRST mission into underprivileged communities.

Outreach in elementary schools is vital to maintaining an equitable STEM ecosystem. For the past 5 years, we've attended annual science nights at 4 local elementary schools. Because we have established FIRST programs at every school in our cluster, when students at science nights show interest in our robot, we're able to direct them to join their own school's FIRST team. Our programmers even created "Outreach Mode" for our robot so youth can test-drive it at a slow speed. Since COVID, we've continued supporting robotics at feeder schools, running virtual workshops and letting students shadow our meetings.

Ultimately, we're dedicated to serving the communities around us and carrying out the FIRST mission no matter the circumstances. By giving underserved communities hands-on engineering experiences, we support the strength and interconnectedness of our STEM ecosystem. Diversity, inclusion, and acceptance are fundamental to the G3 ethos, and these values shine through in everything we do.

