

***FIRST* Impact Award - Team 8393**

2024 - Team 8393
Team Number
8393
Team Nickname
The Giant Diencephalic BrainSTEM Robotics Team
Team Location
Baden, PA - 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.
BrainSTEM provides STEM programs to supplement lackluster local educational offerings. Over 10+ yr. history has a 100% high school graduation rate. 100% of graduates have gone on to college majoring in STEM degrees. College alumni work in STEM related jobs at tech companies (e.g., Amazon), robotics companies (e.g., Astrobotic), research labs (e.g., Bettis Nuclear Lab), start-ups, and in healthcare. Alumni are committed to FIRST and volunteer at events across FIRST Programs. Dean's List Winner.
Describe your community along with how your team addresses its unique opportunities and circumstances.
Pittsburgh's industrial past created over 90 unique neighborhoods with diverse populations. The unique barriers that children in these communities face trying to pursue their passions awakened us to needs that transcend geography and require us to broaden our definition of community. As a result, we focus on developing programs that demonstrate how STEM breaks down barriers and boundaries that children face within our global community-educational, socioeconomic, racial, medical, and geographic.
Describe the team's methods, with emphasis on the past 3 years, for spreading the <i>FIRST</i> message in ways that are effective, scalable, sustainable, and creative. How does your team measure results?
We host 13+ FIRST events annually in PA with significant publicity. With 40+ corporate partners, we engage with >15 annually - using their support for volunteers, funding local tournaments, and accessing engineering expertise. We showcase at the Pittsburgh Robotics Network, the largest robotics professionals' meeting globally, to promote FIRST programs. Receiving TV coverage, we eschew personal promotion, gauging success by volunteer recruitment for community events and fundraising for children.
Please provide specific examples of how your team members act as role models within the <i>FIRST</i> community with emphasis on the past 3 years.
Every team member dedicates over 75 hours to outreach. In the last 3 years, we have taught targeted classes for different groups - autistic kids, inner city kids, kids from broken homes, kids from broken

schools. We've designed tools for medically fragile children and used machine learning to help diagnose Melanoma. We traveled to Central America to help kids in Belizean city schools and sent medical teams to provide care to impoverished families in Haiti. Be the change.

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

In the past three years - We have run (and hosted, and supported) 33 FLL Events. We have started 4 FLL teams and 5 FTC teams. We have mentored 15 FLL teams and 4 FTC teams have assisted 150 FLL teams providing weekly feedback and advice on their robots at our educational scrimmages. We have covered the competition costs for 18 teams. We supported an FLL based activity for new PhD students at CMU. We provided the materials (and delivered them) to FIRST Belize to start 20 new FLL 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?

We've ignited passion for STEM through diverse initiatives: Creating tools to allow educational access for medically fragile children, STEM activities for long-term hospitalized children and their families, Supplemental CS classes for inner-city schools, Low-income University Prep Program, City-building workshop for Bhutanese refugees, STEM classes for autistic kids, LEGO superhero day for kids in transitional housing, free summer Robotics camp for kids from low-income neighborhoods.

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 use many models. We engaged our engineering community by opening our Children's Hospital Makerspace support to 40 local companies. We partner with service-minded companies like Tier 1 and Bayer, offering employees meaningful volunteer opps. Collaborating with M-powerhouse, PPS, Slippery Rock Univ., Pittsburgh Technical College, and Dark Rhino Security, we've developed a pathway for underprivileged kids to get supplemental education, enhanced college admissions, and guaranteed employment.

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

Using STEM to break down barriers is our specialty. After teaching supplemental CS classes in low-income Pittsburgh Public Schools, we helped create a program in financially disadvantaged schools where students successfully completing supplemental classes get enhanced admission to two colleges and guaranteed jobs in cyber surety with a partner company. The first 2 graduates started college this fall and have 3.5+ GPAs. Committed to complete inclusion and perfect meritocracy in all interactions.

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

As FLL Regional Partner, we engage with every FLL student in Western PA. Our FLL to FTC transition camps are popular, offering scholarships to exceptional roboticists. A subset of students join rookie-only BrainSTEM FTC teams and climb learning curves with intense mentoring. All FRC team members do FTC in fall for advanced skill development. Fundraising is secured from sponsors who value investment in education over personal promotion. Alumni are active, but have yet to birth new members!

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

Our team values impact over self-promotion, attracting sponsors who share these priorities. Half of our "platinum" sponsors prefer anonymity, drawn to BrainSTEM's extensive commitment to removing barriers hindering children's potential. Sponsors are recruited through local events, trade shows, and engineering outreach, with the option to fund the team or specific outreach. Bayer, our latest sponsor, was impressed by our impact and "had no idea that robotics teams could change the world."

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

Transitioning from FTC World Champ to FRC posed big challenges, placing us at the base of many delicious learning curves. Over 2.5 years, we've made deliberate strides - dedicated summer camps, mentorship from teams like 4467, guidance from engineering experts, and engaging alumni. FRC's scale/speed require different mechanics, and diverse materials demand different fabrication. Now building competitive FRC robots, but managing build timelines and overall weight remain areas to improve.

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

Our mission is to make STEM engaging, accessible, and intense - preparing members for rigorous, meaningful and impactful careers. Externally, we actively break down barriers children face in education (CS curricula/FLL events), socio-economic/racial divides (UPrep4Life), medical challenges (Child's Reach), and geographical disparities (Belize/Haiti). 100% of members go to college, obtain STEM degrees, work in analytic/STEM careers. Programs have impacted more than 5000 kids in the last 3 years.

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 our quest to break down geographic barriers, we embarked on a journey to introduce STEM to kids in Haiti. However, Consulting experts like HaitiH20 revealed more-pressing, crisis-level needs for medical care, food and clean water. We swiftly shifted focus to raise funds for a medical clinic that treated 252 patients and sending 10 Haitian Farmers to training programs. This pivot reflects our commitment to understanding and addressing the immediate needs of communities for maximum impact.

Judge Feedback

Who/When

Feedback

Apr 06,
2024
12:39:33
PM EST

Our guiding question: Where can the next increment of effort create the most positive change? For judges: What is the highest single need that an individual/team could address with 100 hours or \$1000?

An area the team has an opportunity to improve.

Something that really impressed the judges.

Essay

BREAKING BARRIERS THAT BLOCK CHILDREN

In 2010, BrainSTEM emerged as a beacon of hope in a community where quality STEM education was hindered by lackluster curricula. Starting as a simple FIRST Lego League (FLL) team, we have evolved into a global force for change, guided by the ethos of 'Robots Without Borders.' Now, in our 14th year, the pulse of this ethos courses through our veins. We've wielded the power of STEM to dismantle educational barriers and obliterate societal divides of every kind. From socioeconomic disparities and racial inequities to medical disabilities and geographical divides, we are on a relentless mission to eradicate obstacles standing in the way of children pursuing their dreams. We are Team 8393 - THE GIANT DIENCEPHALIC BRAINSTEM ROBOTICS TEAM - we're done accepting limits because someone says they're so - we act - and we relentlessly pursue a future where every child can unlock their full potential.

BUSTING BOUNDARIES IN FLL

A daunting reality of FLL is that 70% of teams participate in only one event, preempting iterative engineering. We built a full season of competitions in Western PA, increased student engagement, and became the FIRST Regional Partner. Subsequent FIRST restrictions on advancement created a setback, so we adapted a format of up to 20 intense scrimmages followed by a championship for all teams. This model, utilizing low-stress educational scrimmages and intense competitive scrimmages transformed student engagement, was adopted by our neighboring region and has been reviewed by FIRST. Additionally, as a region bordering 3 other states, we embrace inclusivity, welcoming teams from any location worldwide - even hosting a team from Jamaica! Robots without Borders!

Quantification of Impact: Hosted 100th FLL event. 75% of WPA FLL teams in 3+ events. In the last 3 years: started/coached 4 FLL teams, financially supported 18 teams, mentored 10 teams, personally advised 190+ teams, hosted 31 events, impacted 1500+ students.

BLAZING TRAILS TO FTC

Among the 600,000 FLL students worldwide, 20% transition to upper-level FIRST programs. Recognizing the urgency of this issue, we embarked on a mission to empower students and mentors to transition to HS robotics. Our groundbreaking FLL to FTC transition camp is an immersive one-week experience that equips teams and mentors with a comprehensive toolkit - including CAD design, 3D printing, robotics engineering, laser cutting, and fabrication techniques. Mini-classes cover essential topics such as materials, components, and drivetrains, while programming basics are taught hands-on. The camp culminates in an interactive building challenge and competition, igniting a passion for robotics and leaving teams energized and prepared for success - bridging a gap and propelling students toward a future without boundaries.

Quantification of Impact: Hosted 8 summer camps, started 5 FTC teams, trained members of 8 additional teams, helped 3 schools start HS FIRST programs, provided free camps to underprivileged kids. Won FTC FIRST World Championship (Game & Inspire Award). Actively mentor 4 FTC teams. FTC Dean's list winner.

BREAKING DOWN SOCIO-ECONOMIC AND RACIAL BARRIERS AND BUILDING BRIDGES

Poverty casts a long shadow, especially in education. Students attending high-poverty schools face a stark reality: fewer science materials, limited opportunities, and scant access to rigorous mathematics classes. These disparities create vast chasms for children pursuing their full potential—a deeply unfair reality that we are determined to change. We began volunteering to teach supplemental CS classes in particularly disadvantaged Pittsburgh Public Schools. Student-led teaching had an incredible impact on both understanding and retention. Working with partners, we evolved our comprehensive computer science curriculum into a program that provides enhanced admissions opportunities into 2 partner colleges and guarantees employment for students completing the program. Initial graduates started college this fall, pursuing STEM.

We put on STEM programs for children at the Longmire school for kids from troubled families, the Best of the Batch Club for kids in historically African American neighborhoods, and STEM Coding Labs for lower income students. We embraced a group of children struggling at the Auberle transitional family shelter helping them become LEGO Superheros for a day.

Additionally, we established a community STEM program in partnership with West View HUB, a grassroots community center in a low-income neighborhood. Through monthly coding and robotics classes, summer STEM camps, and donations of robotics materials and Chromebooks, we are bridging the gap in STEM education access.

We also started the HUBWORKS Wizards robotics team, who successfully competed this past season. Furthermore, we launched an African-American student LEGO team at a disadvantaged Pittsburgh Public School - providing classes, mentoring, and support at robotics tournaments, culminating in the team winning the 'New Community Award' for their local impact.

These initiatives reflect our unwavering commitment to empowering disadvantaged communities and creating tangible pathways to success through STEM.

Quantified Impact: Taught supplemental STEM/CS classes to 50+ students, Developed college/career pathway for students from neglected schools (1st grads in college), started STEM programs in low-income areas, and started an award-winning FLL program for African American students.;

