

Chairman's Award - Team 3928

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2021 - Team 3928

Team Number

3928

Team Nickname

Team Neutrino

Team Location

Ames, Iowa - 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.

FIRST motivates our members to pursue STEM beyond the classroom. Since 2019, 100% of seniors majored in STEM and 63% of current members have taken supplementary classes such as CAD and Metals or Java through Iowa State University (ISU) because of FRC. Alumni support FIRST as mentors, volunteers, and sponsors, such as Bojun who works at Ford, volunteers for FIRST, and sponsors 3928 through his startup, and Dagney, who coaches 6 FIRST teams and has volunteered at 54 FIRST events.

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

3928 partners with ISU to gain access to work in their facilities and provides college students with mentoring opportunities. Since 2011, 3928 has helped create a STEM appreciative community by working with 7 of 8 schools in the Ames Community School District (ACSD), creating 50 STEM kits for 5th graders, and designing and running 29 summer camps, encouraging innovation. Our community spans outside of our country, reaching students we've assisted on an Iraqi FRC team and a Haitian FLL program.

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?

In 2019, 3928 worked with our local library to host the Month of Cardboard, where 177 attendees engineered with cardboard to make various builds. During the pandemic we expanded our online outreach to support students engaging in virtual learning. Stay-At-Home STEAM (SAHS) is a series of 27 STEM Activity videos we posted on YouTube, which has accumulated 3,300+ views to date. We document each outreach initiative into our Tabulated Outreach to serve as a record and a way to measure our growth.

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

3928 has run the Iowa Regional Chairman's Exchange since 2016. Teams present, receive feedback, and build relationships with each other. In 2020, we organized 4 Virtual Chairman's Exchanges that 84 people from 20 FRC teams participated in. This past August, 3928 presented at the FTC Coaches Development Conference about our outreach initiatives and strategies. We began running the Iowa FLL Unconference in 2019 for coaches and mentors to connect and develop skills to better their FLL programs.

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

Supporting other teams is part of 3928's ethos. In the past three seasons 53% of our student members have mentored a combined 43 FLL, FLL Jr., and Robot Basic teams, starting 4 of them. 3928 mentored 4 teams virtually this past semester. In 2020, 3928 started FTC team 18050 Team Photon at Ames High to provide additional local *FIRST* opportunities. Additionally, 3928 has provided resources and assisted the first FRC team in Iraq, Ashur Robotics in collaboration with FRC team #7285 Sneaky Snakes.

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?

Since 2012, 3928 has taught 497 students through Enrich, Empower, Excel (EEE), a multi-week STEM camp, and we've demoed at Edwards Elementary's annual Science Night since 2014. Our latest outreach expansions, our Month of Cardboard event (2019) and Stay-At-Home STEAM initiative (2020) have collectively educated hundreds of elementary students and ignited STEM passion. Most recently, 3928 donated original curriculum and STEM kits for local students, connecting with 50 COVID hybrid students.

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

Since our first demo at the Science Center of Iowa (SCI) in 2012, we have participated in 25 SCI events. In the past 3 years, 3928 has spent 371 hours at their annual Girls in Science Festivals and Mini Maker Faires. As members of 4-H, we host at the County Fair and present at the annual 4-H Gala. After meeting Turkish FRC Team Sneaky Snakes at the Virtual Chairman's Exchange, we maintained a friendship with them, editing their Chairman's submission and presenting at their Winter Workshops.

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

A continued sense of community is vital to 3928; students are admitted to the team solely based on willingness to learn, as commitment and enthusiasm are valued above all else. Our community outreach and recruiting events are focused on anyone excited to participate. To forge new bonds between teammates, 3928 hosts regular game nights, movie viewings, and girls' nights. This season we started a Buddy Group program to foster relations between new and returning members in the virtual age.

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

To prioritize sustainability, 3928 maintains a detailed archive, including our Tabulated Outreach spreadsheet, Comment Cards, How-To training documents, and pit binders. After each event, leadership records how each event is run, contacts for the event, and ideas for future improvement. Furthermore, the 21 FLL teams we've started are designed to be self-sufficient after 2 seasons; 3928 leads meetings, provides resources, and trains coaches until they are ready to lead on their own.

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

3928 facilitates personal, consistent sponsor relationships. 71.4% of our 14 sponsors have supported us for the past 3+ consecutive years. Since 2012, 3928 has visited and presented our robot at 30 sponsor visits to 9 different sponsors. Based on support level, sponsor logos are displayed on our robot, team shirts, and presentations. We send updates through an annual video and monthly newsletters. Since 2018, 3928 has presented at the Iowa State Research Park to potential mentors and sponsors.

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

3928 values comradery between team members in and out of meetings, so we focused on creating opportunities to form friendships despite the pandemic. This spring, we introduced Buddy Groups, where members gather virtually in small groups to play games and interact outside of full team meetings. 3928 also hosted virtual movie nights, pumpkin carving contests, and team gingerbread house building. Through these initiatives, we've been able to have as much fun together as we did in years past.

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

3928's mission is to develop students into leaders, engineers and community partners. Beyond gaining technical experience working with machinery, CAD, and programming, every member connects with our community through outreach. Three of our alumni have won NCWIT's Aspirations in Computing awards through their time on 3928. Another used his mechanical experience to gain a co-op at Corteva his sophomore year of college. 3928 also expands the *FIRST* family through our mentoring 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.

In 2020, 3928 fostered connections with the first FLL program in Haiti. After personally meeting with the program organizers and discussing their needs, we developed a multi-step plan to give them the resources they need, starting with digital resources, including curriculum, tutorials, and advice, that ensured a sustainable program. To provide hands-on resources, Neutrino packaged and donated 10 NXT kits (including robots, extra spare parts, and instruction booklets) and an FLL field kit.

Essay

Commitment. Expansion. Sustainability. Community. Zeal. These are the qualities it takes to forge a rich and lasting legacy.

Forging A Legacy Since 2011

Team Neutrino's legacy has been tempered through a decade of dedication by members and mentors alike. Each class of students is like the blow of a blacksmith's hammer, refining our legacy further and leaving their own unique mark behind. What began as 9 Ames High School students in 2011 has become a team of 32 Story County students carrying the same fire as those who came before.

To ensure sustainable leadership, 3928's Leadership Core promotes a collaborative environment between sub-teams. The Leadership Core (LC) is led by the Captain and Co-Captain and involves student leaders and mentors. Agendas for LC's biweekly meetings consist of yearly budgeting, organizing summer training camps, planning team meetings, and discussing sub-team successes and challenges. To maintain transparency between LC and the full team, all LC agendas and notes are shared with the team.

Our integration structure lets new students quickly adapt to the team prior to competition season. Since 2017, Team Neutrino has taught 10 annual summer training camps for members in areas such as manufacturing, CAD, programming, video editing and fundraising. This summer we hosted online camps to provide a similar experience despite regulations against in person meetings. As 25% of our members are NEWtrinos, Graphics camp held "Premiere Night," a teambuilding activity to showcase the NEWtrinos' editing skills where they could both learn and become comfortable with the team.

Last season, 3928 incorporated an associate role to provide additional opportunities to students who cannot make the time commitment of FRC. Associates learn all the skills a NEWtrino does, tending to be more dedicated to a specific sub-team. The associate role provides opportunities to become a full team member in a future season as the student gains more familiarity with the team.

Educating Future Generations

3928 fosters the FIRST community in Story County, leaving a growing legacy in younger generations. We run dedicated mentoring programs at 6 of 10 schools in Ames to introduce elementary and middle school students to STEM skills they can use throughout their lives, including programming, communication, research, and leadership. Since 2014, we have mentored 38 FLL and 37 FLL Jr. teams.

Because of the challenges COVID-19 posed, we reimagined our FLL mentoring program. This fall 3928 mentored four middle school FLL teams, participating in twice weekly video calls with FLLers to provide assistance on projects, robot missions, and instilling core values. An FLL coach set up competition tables and laptops in person so students could program their robots from home using Zoom's remote control feature. Further, 3928 hosted our annual FLL scrimmage online this season to prepare our teams for competition.

To remove financial barriers for growing FIRST teams, we run a mini-grant program that allows teams to request funding for specific needs such as season or competition registration fees. This season we provided \$650 in funding to 5 teams and have provided a total of \$5,039 to 33 teams since 2015.

3928 started FTC Team #18050 Team Photon at Ames High School, which provides additional opportunities for high school students to participate in FIRST. Over the summer we ran joint training camps with 18050 to build comradery within our two programs and to provide each other with the skills needed to be successful for seasons to come.

Reaching beyond our borders, this past summer 3928 assisted Ashur Robotics, the first Iraqi FRC Team. We provided written resources (ie CAD guides and graphics templates) and assisted them in developing their own Identity Standards, including designing a logo, writing branding guidelines, and creating social media accounts. FRC Team #7285 Sneaky Snakes from Turkey also provided valuable assistance in collaboration with us. We hosted video calls with both teams to provide insight into running a successful team and recruiting sponsors in the Middle East. 3928 will continue to assist Ashur through their rookie years to provide them guidance and friendship.

Cultivating Lasting Relationships

An important piece to Team Neutrino's legacy is relationships; 71% of our 14 sponsors have supported 3928 for 3+ consecutive years. Sponsors support the team by donating raw materials and funds, as well as providing employee mentors to give professional insight. Of our 13 mentors who work in industry, half of them come from our sponsors.

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Since 2012, Team Neutrino has visited our sponsors to present during annual visits organized by our student-driven fundraising team. Students reach out to potential sponsors, budget our spending, and sustain our relationships. In addition to managing our \$57,200 yearly budget, 3928 students write and submit grant applications to businesses, securing consistent monetary support. 3928's fundraising team also updates sponsors with monthly/bimonthly newsletters and a yearly thank-you video to show supporters the impact of their resources.

Additionally, members are given opportunities to apply their knowledge through the team's sponsorships. Ryan, a junior on the team, now spends his summers working for one of 3928's sponsors, Frontline Bioenergy, organizing construction projects. "These acquired skills that I gathered [from Team Neutrino] transitioned directly into the tasks that I was given, which is very exciting to me and makes me look forward to learning more skills and seeing how they translate into my job," says Ryan, who now gives back to the community by passing on his experiences in design and organization to the FLL students he mentors.

Impacting Our Community And Beyond

Outreach remains an integral part of our team's legacy. Since 2011, Team Neutrino has catalyzed the culture around STEM in Ames, creating learning opportunities for students. Over the past 3 years, we've spent 3,050 hours reaching 38,517 people at 52 outreach events, with all of our members actively contributing to making these events successful year after year.

3928 takes pride in maintaining lasting outreach connections. We've spent 2,978 hours at Ames Community School District's Enrich Empower Excel program since 2012, impacting 497 kids in total. We develop original curriculum for seven classes covering LEGO Mindstorms and Makerspace activities, such as 3D printing and circuitry. 3928 has also attended 25 events at the Science Center of Iowa (SCI) since 2012. Volunteers for our booths at the Girls in Science Festival are never in short supply, and at the 2019 Mini Maker Faire, we brought 22 team members to volunteer at the event and fill up staff shortages.

3928 consistently builds new partnerships to improve and expand our outreach programs. We worked with Webster City High School rocketry team, WC Rocketry, to run Rocket Day at the 2019 Story County Fair. Participants designed and launched bottle rockets, learning about engineering while having a blast! 3928 also partnered with the Ames Public Library to run the Month of Cardboard, where we invited our community to build with cardboard and MakeDo kits. 177 people joined us over three consecutive weeks, and we received glowing responses from parents and kids alike.

The COVID-19 pandemic presented unique challenges for our outreach efforts. To combat this, we produced Stay-At-Home STEAM (SAHS), a 27-video series of kids activities designed to promote learning in quarantine. In order to support our local schools, 3928 also reached out to a 5th grade teacher at Kate Mitchell Elementary to supply her students with 50 STEM Kits that we assembled. Each kit contained four activities covering different areas of STEM, teaching math through fractals and experimenting with polarity in lava lamps.

When the 2020 FRC season was unexpectedly cut short, 3928 reached out to teams across the globe to start Virtual Chairman's Exchanges with the goal of creating a replicable process for other teams to follow. After we hosted the first exchange, FRC teams #967 and #1023 used our instructional materials to host their own. In total, 84 people from 20 teams shared their presentations and advice on topics ranging from outreach ideas to Q&A sessions.

From publishing SAHS tutorials to establishing an international Chairman's community, Team Neutrino keeps our legacy thriving around the world.

Building a Family

Foundational to our legacy are the lifelong bonds created between team members. "Though there were many sleepless nights, at the end of it all, I gained so many good friends and great experiences that I don't think I would have found anywhere else," says Former Team Lead Tianxin. With the switch to virtual meetings, we ensured all members continued to feel welcomed by introducing a Buddy Group system. Leadership paired experienced members and NEWtrinos in groups of 5-6 and met biweekly through video calls to ask questions, play games, and complete challenges. At the end of the summer, all members were split into new Buddy Groups so they could meet more people. Freshman Salim says, "Buddy Groups helped me with creating memories and friends, and that made me want to talk and open up more during meetings." From winter parties and team kickball to virtual fun nights and lunchtime calls on our Discord, Team Neutrino exemplifies family.

Our legacy will continue to be forged by the people we inspire, both within and outside our team. We know that the more students we can inspire through FIRST, the more will be encouraged to thrive in STEM and shape the world into what they dream it to be. Student leader Quinn summarizes our mission well: "With every outreach event we attend, kid we mentor, and student we welcome, we're building a future generation of innovators who will be the next catalysts for change, creating a lasting legacy of growth and inspiration."