

Chairman's Award - Team 568

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2020 - Team 568

Team Number

568

Team Name, Corporate/University Sponsors

BP/JEDC/ASD C&TE/UAA College of Engineering/Schwartz/Alaska Airlines/Washington FIRST & Eagle River High School & Service High School & Akula Elitnaurvik & South High School & West High School & Mat-Su Career & Tech Center & Mears Middle School & Soldotna High School & Dimond High School & East High School & Bartlett High School & Steller Secondary School & Polaris K-12 School

Briefly describe the impact of the *FIRST* program on team participants within the last five years.

Many students on our team have an interest in entering a STEM field after graduation, however, they do not have the resources to develop those interests before leaving high school. Participation in FRC allows them to be connected to a network of mentors and unique opportunities that allow them to grow as creative, independent thinkers. 80-90% (depending on year) of members plan on going into STEM fields.

Describe the impact of the *FIRST* program on your community within the last five years.

In 2018, we began publishing Riley Robot children's books, which encourage readers and listeners to accept help and introduces *FIRST* values. We volunteer at an average of 5 FLL and 3 FTC events per year, and have reached (and have team members from) 14 schools in Alaska and Mexico. We have had an increase in the number of Nerdlets from 4 three years ago to 8 now, showing increased interest in *FIRST* among middle school and younger kids.

Describe the team's methods for spreading the *FIRST* message in ways that are effective, scalable, sustainable, and creative.

We volunteer at *FIRST* events, logging about 500 person hours per year, including hosting and running the Anchorage FTC kickoff. We are at work on a series of children's books, of which 4 are finished, and 3 more are in the illustration process. In the future we plan to write many more books and possibly publish them as a series that could be found in libraries across the world.

Describe examples of how your team members act as role models and inspire other *FIRST* team members to emulate

The Nerdlet program is a chance for middle school students to be mentored and learn about what it's like to be in FRC. Thus far, 100% of Nerdlets have become FRC members as high school freshman. Our team consistently provides volunteers for FLL and other first events while modeling *FIRST* core values. This year our team made up over 20% of the FLL state volunteer force. Our team won the Team Spirit Award for the Galileo-Roebling Division last year at the Houston World Championship.

Describe the team's initiatives to help start or form other FRC teams

Alaska has very low population density and struggles to sustain >1 FRC team over time. Since 2012, we've expanded to become state-wide, now representing 14 schools from 8 communities across a 90,000+ sq mile area (not including our member in Mexico). 13 of those schools have fewer than 3 students on our team, students who would not otherwise have access to FRC. We may not be able to create new FRC teams, but we use our team as a vehicle to ensure all students in Alaska have access to FRC.

Describe the team's initiatives to help start or form other *FIRST* teams (including Jr.FLL, FLL, & FTC)

We have volunteered at multiple FIRST in Alaska events such as the Alaska Society of Technology in Education (ASTE), Reading Rendezvous, and the Alaska State Fair conference, where our team communicated to teachers and parents how to set up a new FIRST team. Our team has also volunteered at the inaugural FTC coach training in Alaska, where we helped train 20 new prospective coaches.

Describe the team's initiatives on assisting other *FIRST* teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the *FIRST* program

We hosted and ran the Anchorage FTC South Central Kickoff. We provided workshops on strategy as well as promoting the FIRST progression and providing opportunities for game Q&A. We volunteer at FIRST events of all levels, where we are often a large percentage of the volunteer force. Our team co-hosted a Post-Earthquake session for FLL teams whose robots and/or facilities were damaged during the 7.0 earthquake in Nov 2019.

Describe how your team works with other *FIRST* teams to serve as mentors to younger or less experienced *FIRST* teams (includes Jr.FLL, FLL, FTC, & FRC teams)

Every year we strive to mentor and help younger teams, such as FLL teams. We often provide support and help to FLL and have assisted multiple teams through the Post-Earthquake session. We also have expanded on the Nerdlets, our "members in training" program for middle school students. We also work closely with FTC teams by offering them support at tournaments and providing feedback on their robot designs.

Describe your Corporate/University Sponsors

The Juneau Economic Development Council, which is the biggest backer of FIRST in Alaska, pays our registration fees. The University of Alaska Anchorage College of Engineering provides lab space and mentors, as well as access to industrial equipment. The Anchorage School District, University of Alaska Anchorage Center for Community Engagement and Learning, Marathon Oil, GCI, BP, Conocophillips, Sound Medical Laboratory, Alaska Airlines, and over 20 private individuals all give monetary donations.

Describe the strength of your partnership with your sponsors within the last five years.

This year we have been working with UAA closer than ever. The UAA College of Engineering is providing us with lab space including a machine shop, loading bay and conference rooms, coaching from a K-12 Outreach Coordinator, consulting from a UAA machinist and advice from the UAA robotics team. Recent collaboration with the Loussac Library has led to their librarians editing our Riley Robot books, providing feedback, and possibly including them in their library.

Describe how your team would explain what *FIRST* is to someone who has never heard of it

FIRST is a robotics competition where students of all ages can compete in a safe environment. FIRST is a program that teaches students as well as mentors not only how to build a robot, but also the soft skills needed by STEM professionals, such as Gracious Professionalism. FIRST is more than robotics. It teaches you to be competitive and successful not for the sake of competition, but for the sake of progress and making a difference. FIRST is a family.

Briefly describe other matters of interest to the *FIRST* judges, if any

One of the largest struggles in Alaska is the huge distance between our members and especially between us and the competition. Our team flies each year during our spring break missing a few days on either side. Each year our team flies about 4,500 kilometers and then drives about 500 kilometers. Our team is spread across the entire state, and we pull from all aspects of Alaska. We also must sometimes deal with other problems created by our geography, such as the 7.1 earthquake last year.

For FRC teams older than 5 years, briefly describe your team's broader impact from its inception.

Our team was founded in 2001 as a small team housed in a garage and have grown into a statewide program that encompasses FLL Jr., FLL, FTC and FRC students, with about 450 students that have been on the team. Currently, our team is working to improve youth literacy in the state of Alaska. We have written several books, with more in progress, that are designed to promote literacy. We promote the books by volunteering at events in Alaska hoping this encourages literacy and youth interest in STEM.

Team Captain/Student Representative that has double-checked this submission.

Caden Boyer

Essay

MISSION AND VISION

Nerds of the North Team 568 is the only FRC team in the state of Alaska. Founded in 2001, our mission is to demonstrate FIRST's core values in everything we do, especially by growing the next generation of STEM professionals. Our vision is to overcome geography in support of FIRST in Alaska. We enrich the lives of team members and our community through the power of STEM and FIRST's core values.

TEAM CHARACTER

As the only Alaskan FRC team, we provide students across the state access to robotics. Our team is composed of 34 high school students, 8 middle school students (team members in training), and 11 mentors. Our members come from 14 different schools, only 50% of which live in Anchorage. Our members live in Anchorage, Wasilla, Moose Pass, Cordova, Eagle River, Kasigluk, and Fairbanks, as well as Yucatan, Mexico in an area of 450,000 square miles. While our meetings are physically held in Anchorage, we have a thriving virtual connection with the 20% of team members who cannot attend regular meetings and those who have no other opportunities to participate in FRC.

TEAM STRUCTURE

Over the past 5 years, our team has consistently worked to improve our structure, impact in Alaska, and embodiment of FIRST. Our team has developed a more efficient structure, including 7 leadership positions to govern over two team departments. We have developed a full business department and created our first set of official bylaws to better structure our team. We hold members accountable using our 'member in good standing' clause, ultimately seeing an increase of our outreach man hours by 84% from the previous year. We have also integrated a variety of project management tools to increase our efficiency, such as a hybrid of Work Breakdown and Product Breakdown Systems integrated into Gantt Charts.

DIVERSITY AND INCLUSIVITY

We believe that everyone should get an opportunity to participate in robotics, and so our team strives to advance diversity and inclusivity. We are working to close our team's gender gap, increasing the percentage of female team members by 150% since 2018, including both official team members and the Nerdlets (members in training). We work to include girls on the team, and actively seek out middle school girls who will be able to join when they're older.

To achieve this, we conduct outreach at STEM events specifically aimed at girls. Team members have been participants, volunteers, and mentors at events such as Smart Girls Rock! and Introduce a Girl to Engineering. We have provided tours of engineering labs, robot demonstrations, and interactive activities explaining the engineering process. Over the past 2 years have reached approximately 200 middle and high school girls at these events.

We also seek to eliminate financial barriers of participation. Many of our members struggle with making the financial commitment to travel to competitions. While there is no fee to join the team, there are no local competitions in Alaska, so our members must pay for their own travel to get to competition sites. This year we have instituted a system for travel scholarships paid for by sponsorships. Members can apply for need-based scholarships in order to have the funds to travel. 30% of our travel team would not be able to attend competitions without this scholarship opportunity.

UAA PARTNERSHIP

For its first 17 years, our team was housed at A.J. Dimond High School in Anchorage, but the last 2 years we have partnered with and been hosted by the University of Alaska Anchorage College of Engineering. We are grateful that UAA has allowed our members access to their lab and meeting spaces. We also created a UAA approved safety program that all team members are required to complete in order to use the equipment and space. UAA has granted us access to professors and machinists who have mentored the team in robot design and building. The UAA robotics team has also provided mentors who work with us closely to provide guidance and input. The UAA Center for Community Engagement and Learning has funded two college student assistant positions to support outreach programs and help expand the team.

RECRUITMENT AND NERDLETS

We use our off-season in fall to help recruit new members to sustain the team. Through specific recruitment meetings promoted through FIRST in Alaska, high schools, and our social media, we give dedicated time for interested members to learn about our team. We walk new members through each department, describe our team, and introduce people to FIRST and FRC.

The Nerdlets are middle school "team members in training" who are given the opportunity to enhance their engineering skills, work with professionals in STEM fields, and become more accustomed to FRC. The Nerdlet program has been successful: 100% of last season's Nerdlets joined Nerds of the North this season. We continue to grow this program with 100% more Nerdlets joining this year, and encouraging younger students to pursue FRC.

Essay - page 2**OUTREACH OVERVIEW**

Our team values outreach and has devoted numerous hours to our three main outreach initiatives: STEM Education, FIRST Promotion and Support, and Encouraging Literacy. This season alone, we have accumulated more than 125 event hours (time spent volunteering as a team) and roughly 900 hours of combined personal time (the sum of volunteer hours invested by members) of outreach. Over the past two years, we have reached over 6,500 people across all ages and grade levels.

OUTREACH INITIATIVE: STEM EDUCATION

We believe that STEM drives society's forward progress and will lead the world into a brighter future. Exposing youth to STEM topics allows for the potential for pursuit in these fields. This belief is why we conduct youth outreach.

Over the past 2 years, we have volunteered at 10 summer camps at the UAA Summer Engineering Academies and at the Anchorage Museum. We taught students how robots work, and how to program and drive a robot. We presented students with challenges and encouraged them to work together to find creative solutions and practice cooperation and gracious professionalism.

Our team has also volunteered at dozens of local STEM Days Events, where we provide hands-on activities that teach children STEM concepts beyond robotics, including binary beaded bracelets, paper airplane launching, and kazoo making. This year, our team has collectively spent over 150 hours teaching STEM concepts to nearly 500 children.

OUTREACH INITIATIVE: FIRST PROMOTION AND SUPPORT

Encouraging and supporting our fellow FIRST teams is something we continuously strive to do, and we have devoted 75 hours to this initiative. We have hosted and run the Southcentral Alaska FIRST Lego League and FIRST Tech Challenge kickoffs for several years. We have volunteered at and organized FLL Qualifiers and State Championships, along with FTC Qualifiers and State Championships, for the past 9 years. This year alone, our team represented over 20% of the FLL State Championship volunteer force.

We also support FIRST teams throughout the season to help them reach success. Our team president mentors a local FTC team, and 12% of our team members are active on FTC teams. Last year, when the 7.0 magnitude earthquake struck Alaska the week of FLL Qualifiers (November 2018), it left many FLL teams without locations to meet. We assisted 4 teams to prepare and practice for the newly scheduled competition.

Another way we promote FIRST is by volunteering as representatives at events such as educator conferences, where we interface with community members and encourage startups of new teams. This summer, we volunteered at FIRST in Alaska's new model of coach training, where we mentored 20 new FLL and FTC coaches through an entire season of robotics in just 1 week. We got to see a number of these coaches with their teams at the state championships at the end of their first season.

OUTREACH INITIATIVE: ENCOURAGING LITERACY

According to UAA, illiteracy is a common barrier to college-bound students, and Alaska has consistently ranked as the nation's lowest in 4th grade literacy. Alaska has an 11% illiteracy rate, and our team members believe we can help fix this problem. Over the past 3 years, our team has written and illustrated a number of children's books about Riley Robot, which span three themes: math, science, and social lessons. We hope this literacy initiative exposes students interested in engineering to these values along with increased reading proficiency.

When we learned that 20 of Alaska's Native Languages are endangered and forecasted to go extinct by the end of the 21st century, we partnered with FTC teams across Alaska to translate our books into Yup'ik, Cup'ig, and Tlingit. Through this, the Tlingit Native elders decided to add a new word, "Kashóok' Kaà," meaning robot, to their language. This improves access to STEM concepts for students whose families or communities may speak limited English, while encouraging literacy in their native language.

Looking forward, we are working toward the expansion of our Riley Robot series. We created a website based on the book and read the book aloud to students at local library events, schools, and engineering summer camps. This year we have created 8 new stories, and consulted with a local chapter of Girl Scouts to get ideas and feedback from our target audience. Just like the engineering design process, creating and publishing Riley Robot showed us that continuity of testing and revising is essential to our success. In the future, we are looking to publish these books, along with creating more books which explore a broader range of topics and languages.

FUTURE GOALS

Our team has accomplished a lot since our inception, but we're not satisfied yet. As a statewide team we want to further our connectivity with virtual members. We also want to find new ways to connect with our community and continue to recruit a diverse group of future engineers while promoting literacy, STEM, and FIRST.