

Chairman's Award - Team 1011

Team Number

1011

Team Name, Corporate/University Sponsors

Sigma Technologies / Raytheon / Mr. Brian Maki / Industrial Metal Supply / Cindy Bingham / Brian Cloutier / APEX Technologies / Honeywell / IBM / Hanlon Engineering & Associates / M3 Engineering / CAID Automation / Sunland Asphalt & Sealcoating & Sonoran Science Academy - Tucson

Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2016/2017 year and the preceding two to five years

-1011 student Cecilia said, "CRUSH provides an outlet for everyone. It's empowering to know that no matter your talents, you'll find a home with CRUSH." -We teach teamwork & communication skills, confidence, technical expertise, GP, & mentorship -40% of 1011 students experience grade improvement -100% of students are more interested in STEM -15 internships from partners -10 alumni mentor FIRST Teams -100% of alum go to college & 90% pursue STEM -Attend prestigious schools: MIT, Stanford, WPI

Describe the impact of the *FIRST* program on your community with special emphasis on the 2016/2017 year and the preceding two to five years

-Community Member Michael Hartung said, "1011 is professional, articulate, outgoing, passionate, & proud. They clearly love what they are doing & they love sharing it with others." -500 Outreach hours at 17 events in 2016/17 -800 Outreach hours at 34 events since 2012 -1000+ Volunteer hours at 6 FIRST events in 2016 -Brought 5 FIRST Events to Tucson in 2016 & 9 since 2015 -We give back through community service -Recognized by the Pima County Board of Supervisors for our positive impact on Tucson

Team's innovative or creative method to spread the *FIRST* message

In December 2016, we introduced 38,000 people to FIRST at the Arizona Bowl. At the NCAA College Football game, we created a pregame STEM experience that engaged sports fans, who otherwise wouldn't have known about FIRST. During the halftime show, 1011 was highlighted alongside other prominent community organizations & businesses. We inspired a new audience to appreciate the connections between sports & FIRST, while promoting sportsmanlike values such as Gracious Professionalism & Cooperation.

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

-Mr. Lim from FRC 610 said, "I don't know if I've seen a team exhibit the level of pure, genuine, unbridled enjoyment of FRC as 1011. It is a special team that can make those AROUND them enjoy the FRC experience that much more, regardless of how your robot is doing on the field." -1011 is the 1st team others reach out to -1011 has grade standards & provides support for struggling students -We celebrate volunteerism, student leadership, strong image, enthusiasm, & breaking stereotypes

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

-CRUSH plants new seeds -As the 1st FIRST Team in Tucson, we built the foundation for FIRST & FRC - Robolympics/Tucson Tussle promotes FRC in Southern AZ & initiates FRC teams -AZ FIRST Student Division (AZFSD) increases chances of success & team retention -1011 shares resources with local FRC teams -In 2014, 1011 organized "Even You Can Be FIRST" Workshop Series on all levels of FIRST to attract & train new mentors, sponsors, teachers, & students -Started 4 FRC teams & mentored 5 since 2006

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

-Started 5 other FIRST teams in 2016 & 9 since 2012 -FIRST teams at all district schools -AZ FLL & FTC Affiliate Partners rely on 1011 as liaison for FIRST in Southern AZ -We remove barriers for teams: our nearby tournaments have doubled the number of FTC teams in Tucson -Match teams with grants & donate FLL kits -Host FLL Coaches Training for 20 teams in 2 years -Present at schools & invite potential coaches to our shop -Partner with community centers like the Boys & Girls Club & Higher Ground

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

-FLL Coach Emily Spiessbach said, "We knew the [FLL Tournament] would provide so much growth on that day & get them ready to tackle FTC these next years! I am seeing your vision of all the possibilities! Our 11 kids have made memories for a life time & growth that would not have happened otherwise!" -Identify older FLL teams who are ready to transition to FTC -CUTIE Program includes all 4 levels of FIRST -Starting CUTIE Programs at other schools -Promote progression of programs at tournaments

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)

-1011 students instill FIRST values in all corners of the community through mentorship -The CUTIE Program offers 1011 members the unique opportunity to work closely with younger teams -Mentored 7 teams in 2016 -Mentored 13 individual teams in our history & mentor 5+ annually -In 2016, 1011 students mentored 6 teams at Title I Schools -Assisted 24 teams in fall 2016 & 40+ since 2012 -We assist through workshops/scrimmages, our open shop policy, the AZFSD, emails, & collaborative meetings

Describe your Corporate/University Sponsors

-IBM: 15yr sponsor & mentors -Sonoran Science Academy: 15yr sponsor, facilities, & outreach events -CAID Engineering: 9yr sponsor, donated Boys & Girls Club FLL kits, & internships -m3 Engineering: 9 yr sponsor -Hanlon Engineering: 8yr sponsor & internships -Tucson Children's Museum: 5yr sponsor & outreach events -Honeywell: 3yr sponsor -Industrial Metal Supply & CAID donate thousands in material -70% of our 2016 & 2017 robots are donated material -Previous grants from Raytheon, NASA, & Boeing

Describe the strength of your partnership with your sponsors with special emphasis on the 2016/2017 year and the preceding two to five years

-Hanlon Engineering said, "I see CRUSH students as future employees with skills & knowledge & the understanding of responsibility...Sometimes we wish these students would 'teach' our full time employees these values!" -Partners provide networking opportunities & promote FIRST & we advance their missions -Companies provide mentors, student internships, & tours -1011 demos at company outreach events & promotes partners on t-shirts & robot -We host an annual Sponsor Expo & present recognition gifts

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

1011 has been a fixture in FIRST since it began in Arizona 15 years ago. Since then, we've transformed our school with STEM curriculum & FIRST spirit, & become a role model for FIRST teams statewide. We've grown STEM roots in underrepresented communities through dedication & compassion. We've helped hundreds of Arizona FIRST students make connections through the AZFSD. We founded & support FIRST teams as far away as Mexico. In 15 years CRUSH has made FIRST accessible for thousands of students.

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

FIRST is an international K-12 organization that celebrates STEM, teamwork, & Gracious Professionalism. From programming LEGO robots to working in a machine shop, FIRST enables students to obtain lifelong skills through mentorship & real-world constraints. In addition to building robots, we engage in community based activities aimed at creating a world in which STEM is celebrated & more accessible. Through FIRST advocacy & implementation, we inspire & empower students to pursue their dreams.

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

Reid Loeffler

Essay

An orange tree grows in the desert. What began 15 years ago as a small seed has blossomed into an expansive orchard that branches across Southern Arizona & beyond. Our orchard has grown into a network of students, community members, & organizations rooted in FIRST. Through creating, nurturing, & cultivating our orchard, we have truly transformed our desert home into a FIRST oasis. Our first step to lay the foundation for our orchard was outreach. 1011 has been an asset at 63 outreach events since 2012, & at 34 events since 2015. At Tucson Meet Yourself, Tucson's largest multicultural festival, we emphasized FIRST culture & its role in the community to 40,000+ attendees. We created & hosted Rock for Robotics, a concert highlighting the intersection of art & STEM. We were also invited to the University of Arizona for the Arizona Bowl. We built a STEM

experience that bridged the gap between robotics & sports for 38,000 people. Outreach like this makes connections, sustains FIRST locally, & establishes a culture that celebrates STEM.

In the past year, we gave back to our community in new ways. We formed a partnership with The Leukemia & Lymphoma Society in 2016 through a "Light the Night" Walk. These diseases disproportionately affect teenagers & we wanted to assist the foundation. We volunteered at the walk & showed our support through a robot demonstration. In 2017, we will fundraise to make a donation to the Society in addition to volunteering. We partnered with school clubs this year to uplift our neighborhood through a street cleanup & we adopted our own park. In supporting local people & groups that are significant to 1011 & Tucson, we are investing in our home while promoting FIRST values.

Like our community, there has been a significant cultural shift in our school that centers around 1011. Sonoran Science Academy (SSA) is a Title I School, like all schools in our district. Despite this, we enhanced SSA by providing quality education & extensive STEM opportunities. 1011 has become the backbone of STEM programs within SSA & throughout our district. In 2006, we designed curriculum for a class central to SSA's STEM offerings called Exploring Engineering Through Robotics (EETR) & we continue to support the class as Teacher Assistants. EETR teaches robotics & CRUSH values, even if you are not on 1011. 250 students have completed the course. We further expanded STEM curriculum in 2012 when we initiated a CAD class, & again in 2014 when we recruited a teacher & helped organize the AP Physics curriculum. This is the only AP science course offered at SSA. In 2015, SSA adapted the EETR curriculum to create an engineering class mandatory for all 8th graders.

The school rallies around CRUSH, elevating our work above that of our sports teams & other clubs. Students, administrators, & teachers are among our largest supporters & volunteer sources. SSA holds a Bag & Tag Day Pep Rally, where the student body celebrates the end of our build season. 1011 demonstrates at most of SSA's community events, presents at school board meetings, & was honored with the 2016 Superintendent's Award. Through our efforts to improve STEM education, we have made SSA a role model for district schools that adopted their own FIRST teams & enhanced STEM curriculum.

In recognition of our widespread FIRST orchard, the Pima County Board of Supervisors declared May 2016 "STEM Education & CRUSH 1011 Robotics Team Appreciation Month." The proclamation recognized our efforts to provide STEM & FIRST opportunities locally while positively representing Tucson & Arizona on an international stage. Since then, Supervisor Ally Miller has been an outspoken proponent for 1011 & FIRST. Supervisor Miller attended our end-of-year celebration, features 1011 on her website, & has even tweeted her support of 1011 & FIRST to her constituents! CRUSH Month promoted 1011 county-wide & provided valuable evidence of the unique culture change we created & fostered in the Tucson community.

Much of our effort has focused on planting, nurturing, & growing new orange trees of our own. We started 14 teams in our history & 7 teams in the past 2 years. All 7 teams are at Title I Schools. Many FIRST teams in Southern Arizona have been lent a branch as well. We host annual FLL Coaches Trainings & FLL/FTC Scrimmages. With so many rookie teams in Tucson, these events provide the chance for teams to gain experience & work together, in addition to elevating Tucson's level of robot play. Through our assisting initiatives, we ensure teams have resources they need to succeed on & off the field. The Arizona FIRST Student Division (AZFSD), founded with FRC team 2403 in 2012, provides teams with networking platforms via Facebook & Google+ Meetings. Additionally, the AZFSD allows students to connect through Gracious Professionalism. We created Arizona's 1st offseason event in 2006, called Robolympics. This was the 1st FIRST event in Tucson, which has since grown into the Tucson Tussle. The Tussle is an official, bi-annual offseason event run by 1011 in collaboration with 3 Tucson teams. The event is a major opportunity to showcase FIRST to the Tucson community, host workshops, & encourage Arizona teams to work year round. Through these initiatives, we have assisted 11 FLL Teams, 11 FTC Team, & 2 FRC Teams in Fall 2016 alone.

As teams grow & mature, we tend to local saplings. Within SSA, 1011 structured a FIRST Pipeline called the CUTIE Program that emphasizes mentoring & collaboration. It gives our members the opportunity to mentor, while giving an unforgettable experience to those we nurture. 50% of current members were in the CUTIE Program. 1011 student Liam said, "Growing up with the CUTIE Program & starting with FLL, I've been raised with FIRST values. I don't just use them in FIRST: they're guidelines to my life." In 2015 & 2016, 1011 students were named "Outstanding Youth Mentor" for their work as CUTIE Mentors. We also mentor teams in need of assistance. In 2016, we mentored 1 FLLjr team, 3 FLL teams, & 2 FTC teams.

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One of our proudest saplings began at the Roy Drachman Boys & Girls Club, when our sponsor donated 3 FLL kits in 2015. With the donation, we founded an annual 6 week summer camp at the Club, which has impacted 150+ students. The program provides inspiring FIRST opportunities to students who would not have the experience in their regular schooling. On 1011, we believe every student should have these opportunities, & it is our goal to ensure they are provided. By working with community centers like the Boys & Girls Club & High Ground, we are building opportunities for hundreds of students from nearby schools that are not able to sustain teams due to lack of staff & funding.

For low resource teams in Southern Arizona, a lack of local tournaments can be an impossible barrier to overcome. Travel costs are often the reason teams do not register or make it to competition. In 2015, we set out to change this by hosting & running a new FLL Tournament & the sole FTC Qualifier in Southern Arizona. That year, our events were small, however, we have experienced city-wide FIRST growth. In the past year the number of local FTC teams has

doubled thanks to new accessibility & FIRST grants. Our 2016 FTC Tournament was full with 16 teams, including 2 rookie teams from Mexico. This growth will necessitate 2 Tucson FTC tournaments in 2017. Recently, we were asked by the Arizona FLL Affiliate Partner to host the 1st ever Tucson FLLjr Expo. We will host & run the event in May. With this addition, we will increase accessibility to FIRST for students of all ages in the Tucson Community. As we continue to remove barriers & provide additional opportunities, we are transforming Southern Arizona into a thriving orchard that reaches across borders.

We are not only empowering students on CRUSH, we are empowering our community. In Tucson, 35% of families speak a language other than English at home, & 1 in 4 families live in poverty. With almost 200 Title I schools in Tucson, we have created a foundation of roots rich in vital STEM opportunities that uplift our home. Our roots have reached to underrepresented parts of the community like the Arizona School for the Deaf & Blind (ASDB). Through presentations & STEM Expos we are forging a link between the ASDB & the FIRST community to enhance possibilities for deaf & blind youth. When we make a commitment to a student, we do not let them down. Once we extend our branches or roots to a place, we never let them wither. 1011 student Jose said, "Going into to the community shows kids that they can do this, they can have a future in STEM. We're lifting our community along with us." From the Boys & Girls Club, to the ASDB, to our international FTC Tournament, we provide students with the seeds & soil to grow their own pathway to a brighter future.

In CRUSH, we are also breaking barriers. We come from an array of socio-economic backgrounds, 33% of members are young women, & 65% of our team is Hispanic. Many of our students are first-generation college bound & many qualify for free or reduced lunch. We are crushing stereotypes. 1011 student Javier said, "CRUSH has empowered me to break through the social barriers I face in order to achieve my dreams. Going to college for engineering is no longer just a dream, but an actual reality for me, & I've learned to drop all preconceived notions about my future. I've realized I can achieve anything I set my mind to."

When we planted our roots 15 years ago, we never could have imagined how far the winds of FIRST would carry our leaves. The things we do here matter; FIRST has become a defining attribute of Tucson. Opportunities that did not exist years ago are now abundant. Because of CRUSH, lives have been changed. Over the years we learned that trees do not grow overnight, especially in the desert. However, with dedication, a lot of love, & a little sunshine, even the most arid desert can become a flourishing oasis.