

## Chairman's Award - Team 6317

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2019 - Team 6317

**Team Number**

6317

**Team Name, Corporate/University Sponsors**

John Deere/Davenport Community School District&West High School

**Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2018/2019 year and the preceding two to five years**

Open arms, an exciting STEAM environment, and life-changing opportunities before you. This is 6317. The students that have come through DI have learned that FRC is more than robots. For DI students, FIRST is a future. Students attain knowledge and skills related to technical writing, design process, building, teamwork, communication, programming, presenting, and more. 100% of the INSPIRE Capstone students are pursuing STEAM/Military degrees.

**Describe the impact of the *FIRST* program on your community with special emphasis on the 2018/2019 year and the preceding two to five years**

6317 brings FIRST to all areas. Many hours are dedicated to inspire others and show them countless opportunities for their future. DI helped found the first-ever FLL/FLL Jr. Joint Kick-Off, which hosts approximately 30 FLL and 10 FLL Jr. teams each year! With a total of 25 events, 6317 has volunteered for: -2 Introduce a Girl to Engineering Days -3 Engineering Kids Camps -12 FTC competitions, local and statewide -2 FLL/FLL Jr. Kick-Offs -4 FLL Regional/Worlds Competitions -2 FLL Jr. Expos

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

DI believes in educating students. Being the only team in Iowa to do FRC as a class during school, DI has an innovative approach to spreading FIRST. DI has 4 feeder FTC teams, so students can prepare themselves for the rigors of FRC. The results have been astounding. Because of this innovative approach: -88% of students on DI are in the INSPIRE Capstone class -100% of students on DI have been in at least one of the engineering classes offered -26% of students have been on an FTC team in the past

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

DI students strive to inspire team members and act as role models by practicing Gracious Professionalism (GP) on and off the playing field. A unique add-on for DI to pass on GP is by a multilevel mentorship-structure, showcasing the Alumni Advisor and Alumni Mentor roles. Because of this, alumni stay involved with FIRST in the stages between student, alumni, and mentor. These alumni then act as role models and inspire current FIRST members to emulate and drive forward with determination.

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

In its 3rd season, DI located a group of FLL alumni interested in joining FRC in LaCrosse, Wisconsin. This team, called SPARTA, plans to begin their rookie year in the 2019/20 season. Former mentors of DI moved to Wisconsin and were sought out by SPARTA. Support for this team will be provided relating to funding, day-time FRC, or anything else. DI is actively seeking teams looking to start FRC as part of a daytime school curriculum, and looks forward to finding more opportunities to spread FRC!

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

Although DI is dedicated to starting FRC teams, other levels of *FIRST* are not forgotten! Teams are started by determining need, providing money through fundraising, and intense student effort! For all levels from 2016/19, DI has: - Started 37 FLL Jr. teams -Started 35 FLL teams -Started 3 FTC teams, including a team in Germany -Plans to start 1 FRC team

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

Reaching out to the community has given DI a great deal of experience working with all levels of *FIRST* teams. By sending grant information, mock-judging or reviewing, part providing, and funding, or teaching programming/building, DI has mentored/partnered with: -21 FLL Jr. teams -19 FLL teams -3 FTC teams -4 FRC teams for scouting (1 team from Australia), where data is shared even in opposition!

**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)**

DI and its feeder teams work together to provide robotics workshops and other opportunities locally and afar. Often times, *FIRST* teams come to West High School (WHS) to utilize open labs where one on one student mentoring occurs. DI and its feeder teams have volunteered at 7 *FIRST* Kickoff events teaching Core Values, outreach, engineering notebooks, design process, and CADing. DI is working with FRC 5985 to provide RoboCamps to teach students about engineering principles, teamwork, and more.

**Describe your Corporate/University Sponsors**

DI is strongly invested in sponsor relationships. Since the team began in 2016, over \$100,00000 have been raised for the team in total. DI has received support from: -Financial: Goldstein Family Foundation, Scott County Regional Authority, NASA, Grainger, and The Iowa Governor's STEM Advisory -Financial and manufacturing: John Deere -Design Reviews and Manufacturing: Western Illinois University -Meeting space: Davenport Community School District -Fundraising materials: Deck Supply Services

**Describe the strength of your partnership with your sponsors with special emphasis on the 2018/2019 year and the preceding two to five years**

Every sponsor is recognized as being critical to DI's success. Working hard to create strong relationships with partners has allowed for annual support, which creates strong sustainability. Since DI's rookie year in 2016-2017, they have generated over \$100,000.00 in funding for their program. They have received funding from NASA, John Deere, The Iowa Governor's STEM Advisory Council, Davenport Community School District, the Goldstein Family Foundation, and other companies.

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

"It's the hardest fun you'll ever have." This statement rings true with all 6317 members, alumni, and mentors. From road trips full of team bonding over scratching their heads, to long nights spent together solving a problem found in the 11th hour, the *FIRST* Robotics Competition will challenge you in ways you never imagined possible and build you up to take on anything in the world. *FIRST* means everything to Disruptive Innovation.

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

DI operates a cross-curricular, alternative teaching approach that focuses on preparing students for a successful future. It exists to create a school-wide culture dedicated to providing students an environment where they can choose and pursue select career pathways and develop the necessary skills that lead to post-secondary career and/or college opportunities. DI is an extension of our nationally recognized career programs at WHS. We are the only FRC of our kind in Iowa.

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

Alexa Christiansen

## Essay

"If you think in terms of a year, plant [a seed]; if in terms of ten years, plant trees; if in terms of 100 years, educate children" (Confucius). FRC Team 6317, Disruptive Innovation (DI) in Davenport, Iowa, has adopted this philosophy. Grown from the opportunities provided at Davenport West High School (WHS), DI thinks in terms of the long term growth of FIRST at all times. The team now strives to impact communities across the planet through outreach, and works to plant opportunities of their own.

### Seeds of Opportunity...

DI grew from the seeds of opportunity planted at WHS. These seeds were planted over the course of a decade through Project Lead the Way (PLTW) engineering classes, design challenge teams, and international STEAM projects. With the Engineering Department leading the way, WHS has implemented 11 STEAM Career Academies. These academies range from Engineering to Vocational Welding and created a school-wide culture of students selecting and pursuing a career-technical education in preparation for entering the workforce. The INSPIRE Engineering (IE) Academy allows DI to meet during school hours, and is constantly evolving to remain a program where teamwork, diversity, equality and problem-solving are core values.

WHS has a long history of design challenge teams, which include; Electrathon America (electric cars), Real World Design Challenge (aircrafts), FIRST Robotics, CyberPatriot (cyber-security competitions), Iowa Hawkeye Computer Programming Challenge, and most recently the Lemelson-MIT InvenTeam challenge. All of these student-led teams stemmed from the PLTW classes offered at the school, and have taken students all over the world. From these original teams came the seeds that would grow DI. Another FTC team was started in Kaiserslautern, Germany by WHS. Two other teams in DI's area have been mentored and assisted by the program, and serve as feeder-teams. WHS has started and mentored 41 FLL and FLL Jr. teams between 2016/19. 40 other FLL and FLL Jr. teams have varied between needing mentoring or assistance between 2016/19.

WHS has a strong history of international outreach. In 2017, WHS was approached by Joshua Ngao, the CEO of Fishers of Men Ministries, and asked to assist the village of Muamba, Kenya. DI chose to focus on water purification. The clean water project for Kenya began in 2017, and plans to implement and sustain water purification systems beyond 2023. In 2018, WHS had the opportunity to revitalize a sister city youth exchange Europe to participate in a STEAM youth exchange. A DI delegation and the feeder FTC teams traveled to Kaiserslautern, Germany, where students and teachers strengthened the relationship around STEAM robotics challenges. In 2019, the families that hosted the students will send their children to the U.S. for 2 weeks to fulfill the exchange program.

### Fields of Empowerment...

In the current season, DI works on creating results from existing projects. With a focus on FIRST-oriented goals, such as; promotion and increasing engagement, recruiting mentors of all backgrounds, and preparing DI for competition, while focusing on their main service project, The Kenya Water Project. The team splits resources between the tasks, sacrificing build time for this important project. The seeds of opportunity have produced fields of empowerment.

With the Kenya Water Project, students have been charged with inventing a filtration system for the 20,000 villagers of Muamba. The situation is dire, with unsafe drinking water causing an increase in illnesses and deaths related to water-borne diseases. There are specific constraints on the solution, such of which include flow rate, coliform removal, and limited material access. DI is following two years of research with prototyping, developing instructions and educational materials to train local operators on maintaining the system. DI will implement its first filtration system this summer. In 2020, a delegation of students will travel to Muwaba for in-field testing to improve future iterations of the system. The Kenyan government has expressed interest in the filtration system once safety requirements are met, and have already received over \$2,500.00 in water testing equipment from DI.

6317 not only builds strong relationships with other countries, but also with sponsors, each of which is recognized as being vital to the success of 6317. Lasting connections with the business community has grown into annual support, providing sustainability. Since 2016, DI has generated over \$100,000.00 in funding from companies such as NASA and John Deere.

DI is working to make FIRST available to all students. In Iowa, 6317 is the first and only FRC team to operate during the school day through IE. This unique structure allows students from all walks of life to participate in FIRST, regardless of other commitments. 75% of DI student members would not have been able to participate in FIRST without the IE experience. 10% of seniors are involved with FRC at WHS.

DI works with WHS teams to champion FIRST in their community and across the globe. 6317 is most proud of running the annual STEM Days at the Mississippi Valley Fair. FIRST teams from all over the community are invited to run STEAM activities for children. Since 2017, an estimated 5,000 people have been impacted. Similar events include the school STEAM/Spirit Night/Open House events and the Quad Cities Festival of Trees. In this later event, DI entered a STEAM/FIRST themed tree that featured on the front page of the Quad City Times and promoted FIRST, reaching millions of readers.

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From its roots in Iowa, DI branches out across the globe. In Australia, 6317 has joined 5985 on the Collaborative Scouting Project (CSP). The CSP encourages teams to share scouting duties, data, and analysis - even when in opposition, which is Coopertition in action! DI is also working with 5985 to provide RoboCamps locally, which will teach students about engineering principles, teamwork, and more. 6317 and 5985 are mentoring each other on various aspects of developing a scouting application whilst growing a combined partnership that touches on robot building, award application, and general friendship.

**Acorns and Oak Trees...**

6317 allows past students to remain involved with FIRST in the stages between student, alumni, and mentorship. The goal is to support alumni and retain vital skills and knowledge as the alumni gathers the professional experience needed to become a mentor. Thus, DI created a multilevel mentorship-structure, called the Alumni Advisor and Alumni Mentor roles. In addition to helping 6317, these alumni also benefit from the DI pilot internship program with Deere & Company. This began in 2018, when Deere & Company was offering internships for 1 student from high school. Because of this, 6317 took the opportunity head on, and 9 students applied. 3 of these students received an interview, and all were hired! DI has recently received word that this internship will continue this year with preference given to FRC participants, and looks forward to developing a partnership with Deere & Company. These multilevel mentorship-structures have been so successful that alumni from other teams are being drawn in!

Keeping involved with FIRST is vitally important to students, as is shown by the stories of those on the verge of becoming alumni:

"As a freshman in highschool I was very quiet. I didn't get involved with anything. Then sophomore year came around and I met Mr. Franzenburg. Franz invited me into FRC with open arms and encouragement. All it took was a little push. Through FIRST, I learned the social skills that I am known for today. I was shown how to talk to people I don't know. FIRST gave me the confidence in myself to know what I am doing matters, and also that everything is better as a team."  
-Kane Greenwalt

"My freshman year, I had nothing to my name but the determination to earn the best education I could. I had moved from the south side of Chicago to Davenport, Iowa for an education, leaving behind all I knew, but also leaving behind crippling limitations. I was amazed by the opportunities available in Davenport. My sophomore year, I joined FRC. Being empowered with technical, communication, financial, and administrative skills let me grow into myself, and I became a confident young woman. I am now the Project Administrator of two FIRST teams, have performed hundreds of hours of community service, work as a professional CAD Designer, and have the strongest engineering community in the world behind me. I owe FIRST everything." -Alexa Christiansen

**A Flourishing Future...**

Bountiful harvests are produced by spreading and watering seeds. In this way, 6317 starts and mentors other FIRST teams and encourages growth through DI's unique academic programming. This ensures the vitality of FIRST locally. Then, the more FIRST teams there are, the more FIRST teams there will be.

Recognizing the benefits and success of DI's unique day-time FRC structure underlines the importance of implementing it across the state, with a view to national or even international implementation. To this end, all students in the Engineering capstone are pursuing STEAM related post-secondary experiences in college or the military.

DI is already preparing the ground outside of Iowa, by working to start an FRC team in LaCrosse, Wisconsin. 6317 will be providing support as necessary from the 2019/20 season onwards. The future team will be meeting DI in February at a the state season scrimmage in Cedar Falls, Iowa.

**HarveSTEAM...**

DI works to grow their STEAM program and spread FIRST through their school, community, country and world. The seeds of the past have flourished into fruits enjoyed today, while educating the children in preparation for a bountiful future.