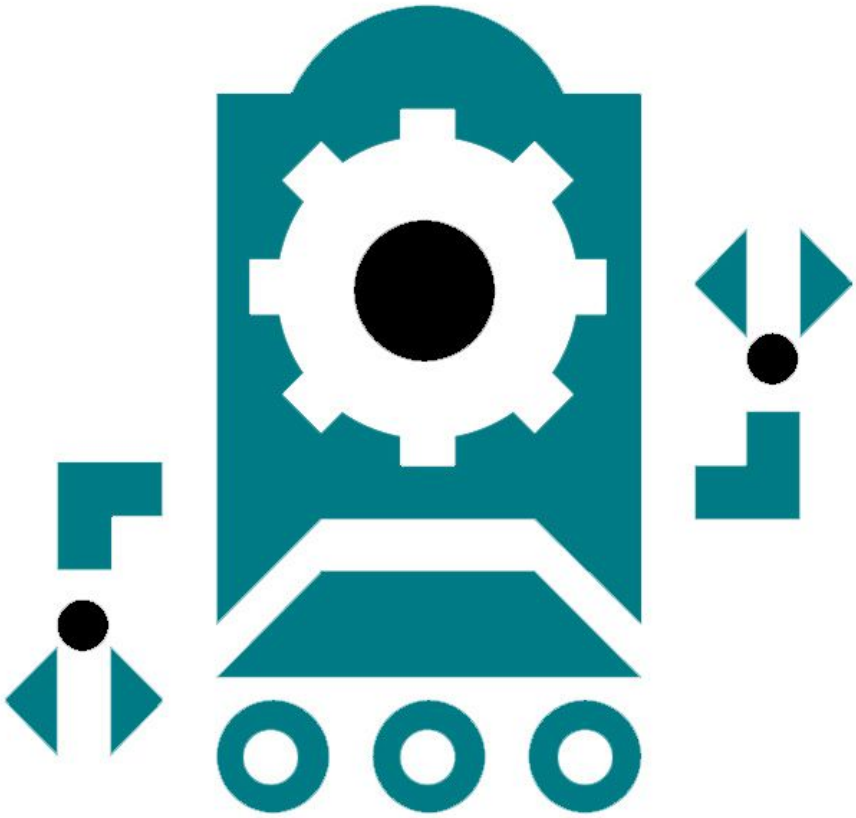

NICOLET

FEAR TEAM 4786

Business Plan

Team 4786 Nicolet FEAR
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Executive Summary - Nicolet FEAR Robotics Team 4786

Our Mission Statement:
We are determined to explore without bounds, advance our scientific knowledge, and create a path to success. We will polish our strengths, overcome our weaknesses, and instill confidence in one another. With gracious professionalism, we will represent ourselves, schools, communities, and families in all aspects of our work.

Team Beginning:
Team 4786 Nicolet FEAR was created as a FIRST Robotics Team on December 13, 2012 by four Nicolet High School teachers: Adam Thiel, Technology Education; Tom Medved, Photography Education; Jessie Barnett, Mathematics Education; and Mark Magnuson, English Education. We had 37 student members in our rookie year and 6 community mentors, in addition to the teacher mentors. Our first competition season was the 2013 FIRST Robotics Competition game "Ultimate Ascent."

Current Team Status:
We are in our sixth season, and our team consists of over 70 student members and over 20 mentors. Our mentors come from industries such as Rockwell Automations, GE Healthcare, Johnson Controls, Snap-on, Foresite Group, as well as founding teacher mentors. We have also implemented alumni from our team as junior mentors.

Location:
Our team is based out of Nicolet High School, in Glendale, Wisconsin.

Sponsors:
Our major sponsors are Rockwell Automation, Snap-On, MSOE, GE Healthcare Volunteers, Todd's Tools LLC, Foresite Group, Johnson Controls, Lippman-Jungers LLC, Nicolet High School, and the Nicolet High School Education Foundation. More information can be found on our website: www.nicoletfear.com

What We Do:
We design and build robots for FIRST Robotics Competitions, providing our student members the opportunity to develop engineering, creative and critical thinking skills while collaborating as part of team, demonstrating gracious professionalism. We support the strength and sustained viability of our team by developing relationships with sponsors, as well as creating unique opportunities to share the excitement of science, technology, engineering and math (STEM) skills within our community and our

school district. We also effectively spread the message of FIRST through launching and supporting younger students in FIRST LEGO League (FLL) programs.

Relationships with sponsors:
We have various sponsors who support us with in-kind donations which can be materials, tools or equipment, food for team meals, or financial in-kind offering where the company matches the employees shared amount or the sponsor donates based on their companies gifting policy. We also have many companies that have corporate programs where employee mentors help anywhere from one day a week to multiple days a week donating their time each week to work with students of FEAR. This volunteering by the sponsors has helped immensely in providing additional leadership to the students and has helped in the team development of leadership skills. We've also implemented a 6 points of contact approach for creating and maintaining worthwhile relationships with our sponsors: an initial letter, follow up phone call, weekly newsletters, invitations to attend competitions, a season summary, a thank you, and offering our services to companies. The Nicolet school board, administration, and the Nicolet Education Foundation have also been strong supporters through this process by their financial support and leadership.

Summary of growth:
Over the past six years, our student members have grown from 37 to over 70, our mentors have grown from 9 to over 20. We have consistently transformed our experiences into better organizing our team structure, emphasizing the importance of communications as well as STEM, extending preseason, offering more opportunities for leadership, recruiting students with non-STEM interests, and greatly improving our performance and standing in competitions. We have spread the message of FIRST in our community through launching and supporting our successful FLL program, sourcing students from the local middle schools into one program housed at Nicolet High School. We've consistently expanded opportunities to share the message of FIRST and excitement of STEM programs in our community and school.

Summary 2018 action plans:
This past year has been exciting in that we have laid the foundation for our future growth and started the process of not only exceeding but setting the standards going forward for our long term success and long term business plan. Some of the items we have completed or are working on for 2018 are as follows:

- Team 4786 has expanded the FIRST LEGO League Program by inviting students from the middle schools of the Nicolet High School District which include Maple

Dale, Glen Hills, and Bayside Middle Schools to participate in the program housed at Nicolet.

- We plan on participating in two regionals each season, which include the Heartland Regional in Kansas City, Missouri, and the Wisconsin Regional in Milwaukee, Wisconsin.
- We have continued to make connections with sponsors by maintaining communications with them throughout our season and displaying our team commitment with the 6 points of contact system. We plan to invite sponsors to all of our competitions to really see what FIRST is about and to better interact with our team.
- We have already participated in the Centro Hispano Food Drive, the local Fourth of July parade, and Maker's Faire for the last few years with great success. We hosted a fundraiser called the Board Game Bonanza in order to raise money for K-12 robotics in October, which we intend to be an annual event. Future plans for FEAR include a Robot Reveal, where we will unveil our robot and showcase our sponsors, VIPs, and members of the community what we have accomplished this year; hosting an outreach event with other teams involving the Milwaukee Brewers and our 2014 project Robot Yount; and the FRC Combine, where teams from all over Wisconsin can attend and showcase their robots' abilities for the gathered sponsors.

Sustainability:

We will consistently make a concerted effort to proactively spread the word about FIRST and FEAR to potential mentors and sponsors. We invite current and potential corporate and community sponsors to visit us working in our labs, and host tours, led by students, that offer engaging presentations. We plan to recruit new junior mentors because FEAR alumni are experienced and passionate for their team and the real world application that FIRST offers. We will regularly invite parents of team members to participate as technical mentors who engage students on a professional level.

During the first few months of school, we plan to organize a massive advertising campaign in order to recruit new students who are interested in not only engineering but graphic design, the humanities, economics, etcetera; all in order to help our team unlock its full potential. As a part of this advertising campaign, the Vice Presidents of Communications and Operations will travel from classroom to classroom to reel in more students themselves.

We created a steering committee in May 2014 to provide financial stability and create a sustainability plan. The committee consists of administrators, teachers and community

members who meet monthly to discuss long term sponsorship opportunities and educational applications of Nicolet FEAR. The main function is to create a growth plan for Team 4786 in terms of financial and human resources. We seek to partner with local businesses for financial stability.

Program Summary

FIRST Description

FIRST was created primarily to inspire students to become leaders in Science and Technology. It was founded by Dean Kamen and seeks to achieve this goal by creating programs that motivate young people to pursue fields of education and career opportunities in science, technology, engineering, and math. Over 400,000 students have participated in FIRST, with over 38,700 teams, 34,000 robots, 90,000 mentors and 90,000 other volunteer roles. FIRST has constructed four different programs for students from the ages 6-18 with increasingly difficult levels of challenge. These include: Junior FIRST LEGO League for ages 6-9, FIRST Lego League for ages 9-14, FIRST Tech Challenge for younger high school students, and FIRST Robotics Competition to provide greater challenge and experience for high school students.

The Junior FIRST Lego League program is designed to involve young students in robotics and increase their interest in the STEM (Science, Technology, Engineering, and Math) fields. Students learn and explore through teamwork, imagination, research, and construction. With the help of mentors, these young students construct a model that can move, using LEGO® blocks, and create a poster to reflect their ideas.

In the FIRST Lego League program, middle school students are given the chance to experience real-world science and technology challenges. The teams are given a scientific challenge and are required to devise a solution, as well as build a LEGO® robot designed to complete in a series of missions. This program contributes to the development of important life skills and open the minds of young students to the exciting career options in engineering.

FIRST Tech Challenge is a competition created for high schoolers to compete using a sports model. Teams of up to ten members design, build and program a robot to compete on a 12 X 12' field. There are two different Alliances made up of three teams each. Students use a TETRIX® platform, reusable from year-to-year, using any coding language of preference. Each team is required to create a strategy and frame a robot using acceptable engineering principles. At each competition awards are given for the robot, design, design, community outreach, and real-world accomplishments.

FIRST Robotics Competition is an international high school robotics competition, hosted by FIRST. Each year, teams of high school students, coaches, and mentors work during a six-week period to build game-playing robots that can complete tasks such as

scoring balls into goals or hanging on bars. While teams are given a standard set of parts, they are also allowed a budget and are encouraged to buy or make specialized parts. With the challenging goals and specifications, tight deadlines, the need to collaborate as team, opportunity to progressively compete with others, students gain the dynamic experience of real-world engineering. FIRST Robotics Competition has a unique culture, built around two values: gracious professionalism and coopertition. **Gracious professionalism** embraces the competition inherent in the program but heavily values the importance of empathy and respect between teams, and **coopertition** emphasizes that teams can cooperate and compete at the same time. Students who participate in FIRST Robotics Competition are eligible for over $16 million in college scholarships and awards. In addition to on-field competition, teams and team members compete for awards recognizing entrepreneurship, creativity, engineering, industrial design, safety, controls, media, quality, and exemplifying the core values of the program.

Team Description and History

FIRST Robotics Competition Team 4786 Nicolet FEAR (Future Engineers of American Robotics) was founded in December 2012 by 4 teachers at Nicolet High School in Glendale, Wisconsin. Engineering teacher and lead mentor Adam Thiel was approached by representatives from FIRST and Automata FIRST Robotics Competition Team 1864 about launching a team in the North Shore Area of Milwaukee. After a unanimous vote by the engineering students, the Nicolet FEAR FIRST Robotics Competition team was born. The transition from Bots IQ, the previous competitive robotics program, needed to come with a 'dynamic change of mind of what a student needs to do in order to be successful,' according to Mr. Thiel. The students welcomed this challenge with open arms, thus Mr. Thiel's engineering classes expanded to incorporate messages of FIRST such as gracious professionalism, collaborating as a team, managing time, and strengthening critical thinking and problem solving. Our mission statement, written by the students, states: **We are determined to explore without bounds, advance our scientific knowledge, and create a path to success. We will polish our strengths, overcome our weaknesses, and instill confidence in one another. With gracious professionalism, we will represent ourselves, schools, communities, and families in all aspects of our work.**

Beginning with 37 students and 9 mentors, Team 4786 Nicolet FEAR was launched, successfully building a robot for and entering a competition our first year. As the team rolled forward into their second year, they transformed first year experiences into better organizing the team structure and their schedule, adding a robust preseason, recruiting students outside of engineering, entering two competitions and greatly improving their performance and standing. In our sixth year, we are comprised of 65 diverse students, as well as 5 teacher mentors and over 31 mentors from corporate sponsors and the community.

Nicolet FEAR exemplifies the mission of the FIRST Robotics Competition, which is to inspire young people to become science and technology leaders. Every student member of Team 4786 strives to build a strong foundation for their future, and their participation on this team allows them to gain skills and experiences that will support their future success. Students commit to working long hours in the lab, collaborate to coordinate complex tasks under tight deadlines, and promote the values and strengths of the team and FIRST in the community. By embracing these qualities in all that we do, we are a testament to the spirit of gracious professionalism that FIRST promotes, and aspire to become role models for all around us. Through our business plan, we hope to establish sustainability in order to ensure our team maintains and improves our vision.

We want to continue improving and expanding our FLL program to introduce more students to STEM, and strive to provide scholarships and internships to graduating members, giving them invaluable opportunities and experience for their years beyond the team.

At the end of each season, we intend to stand out as a robotics team that demonstrates gracious professionalism both in the lab at Nicolet High School and in our community. Our mission, to advance scientific knowledge and create a path to success for our teammates, is shown throughout our accomplishments in the FIRST community. We have seen success in our team. One of our founding members, Christopher Welker (NHS class of 2014), was named a 2014 Dean's List Wisconsin Regional Finalist and displayed true leadership and dedication to our team. Winning the Underwriters Laboratories Industrial Safety Award at the Northern Lights Regional in 2015 inspired our team members and our teacher mentors to implement even more safety procedures and create more support for our team Safety Captain. Networking with teams like Team 2512 Duluth Daredevils enabled us to finish as a Regional Finalist in 2015 and a Regional Semi-Finalist in 2016 at the Northern Lights Regional. Our student members have written and edited this business plan along with all of the awards submissions and essays, and have given countless tours and interviews to sponsors, community members, and FIRST judges. We were excited to win the Kleiner Perkins Caufield and Byers Entrepreneurship Award in 2016 at the Northern Lights Regional. We have also received the Jack Kamen Imagery Award at the 2017 Northern Lights Regional and at the 2017 Wisconsin Regional.

Organizational Structure and Roles

Nicolet FEAR has steadily grown to become a diverse group of talented students and mentors. FEAR is a completely student-led team, with minimal guidance and support from teacher mentors and technical mentors. Students retain responsibility for making decisions related to the products of our team, solving problems related to the FIRST Robotics Competition, leading Work Groups, and assembling a functioning robot. Technical mentors take a supportive role, limiting their involvement to responding to questions. Teacher mentors create and enforce team policies and procedures and work alongside the students as technical mentors do.

Following our failures at the Northern Lights Regional last year, the team took action and began gathering data from team members to assess our potential areas of improvement. We concluded from this data that a majority of our team problems resulted from a lack of cohesive goals, lack of cross-trained students, and lack of interdepartmental communications. With this in mind, we worked to redefine our values, goals, and organizational structure to achieve the most effective business design possible.

The restructuring of our team began in preseason. This year, we implemented a system of Sprints. A Sprint is a week long session where members are assigned to a specific Work Group which works on and completes a specific task in a multitude of areas like robot design, sponsorship, or programming. Sprints encourage timely completion of specific projects which helps our team avoid creating projects but then never following through with them as in previous years. Additionally, we are being more lean and conserving our time by not having to waste time assigning tasks. When a member gets to a FEAR meeting, they know exactly what they are working on without wasting time spent sorting out responsibilities.

Another business renovation for our team this year came with the creation of the Systems team. The job of Systems is to oversee the robot production and ensure that all criteria are being met in order to create a final robot that meets our standards. Systems is responsible for creating the criteria that all of the Work Groups have to follow when designing the drive base, chassis, and game mechs. By creating an overarching set of criteria, Systems allows the team to have more organization and communication instead of working on separate projects where everyone is not on the same page. This leads to build season being a lot more lean in terms of preventing wasted time and materials. Being lean is a concept heavily emphasized in Systems. While Systems is a seperate sub group of students, those students are also included in sprints and function as normal

team members. Also, this year we implemented a Tactics team, with the responsibility of finding the best ways to score and the Most Efficient Tactic Available, or META, for the FIRST game that year.

In terms of build season, our team structure was previously split up into two branches, Engineering and Team Relations, with each branch working independently of each other throughout the duration of the season. Our team president oversaw both of these branches and the departments within. To fix a rampant lack of communication between branches, Nicolet FEAR established two vice presidents to work in a leadership trio with the President. One Vice President oversees the communications branch while the other oversees the Operations branch. Additionally, vice presidents are responsible for the delegation of project managers of a given project and delegation of funds to complete projects. These three executives have frequent meetings to discuss the progress of both branches and report back to the president. By dividing the executive work among two Vice Presidents and a President, the team benefits by having an increase in special attention to the specific needs of the Communications and Operation branches.

The Communications Branch establishes and maintains relationships with current and potential sponsors, organizes our participation in community events, and controls our media presence. Our branding reflects our values and team spirit, including the awards we create for other teams at competition.

The Operations Branch constructs the game robot and builds field elements for practice. Tactics analyzes strengths and weaknesses, making the most of both in competition. Systems oversees robot production and creates criteria for our work groups, enabling better communication throughout the design process.

Additionally, in the past, Nicolet FEAR was divided among eight departments: Strategy, Robot Design and Manufacture, Electrical, Business, Community Outreach, Media, Programming, and Special Operations. Within the first week of preseason, every team member was assigned to work in a specific department which is where they remained for the rest of the 11-week season. Two issues emerged as a result of dividing our team into such stagnant departments: a lack of communication among departments and a lack of cross trained students.

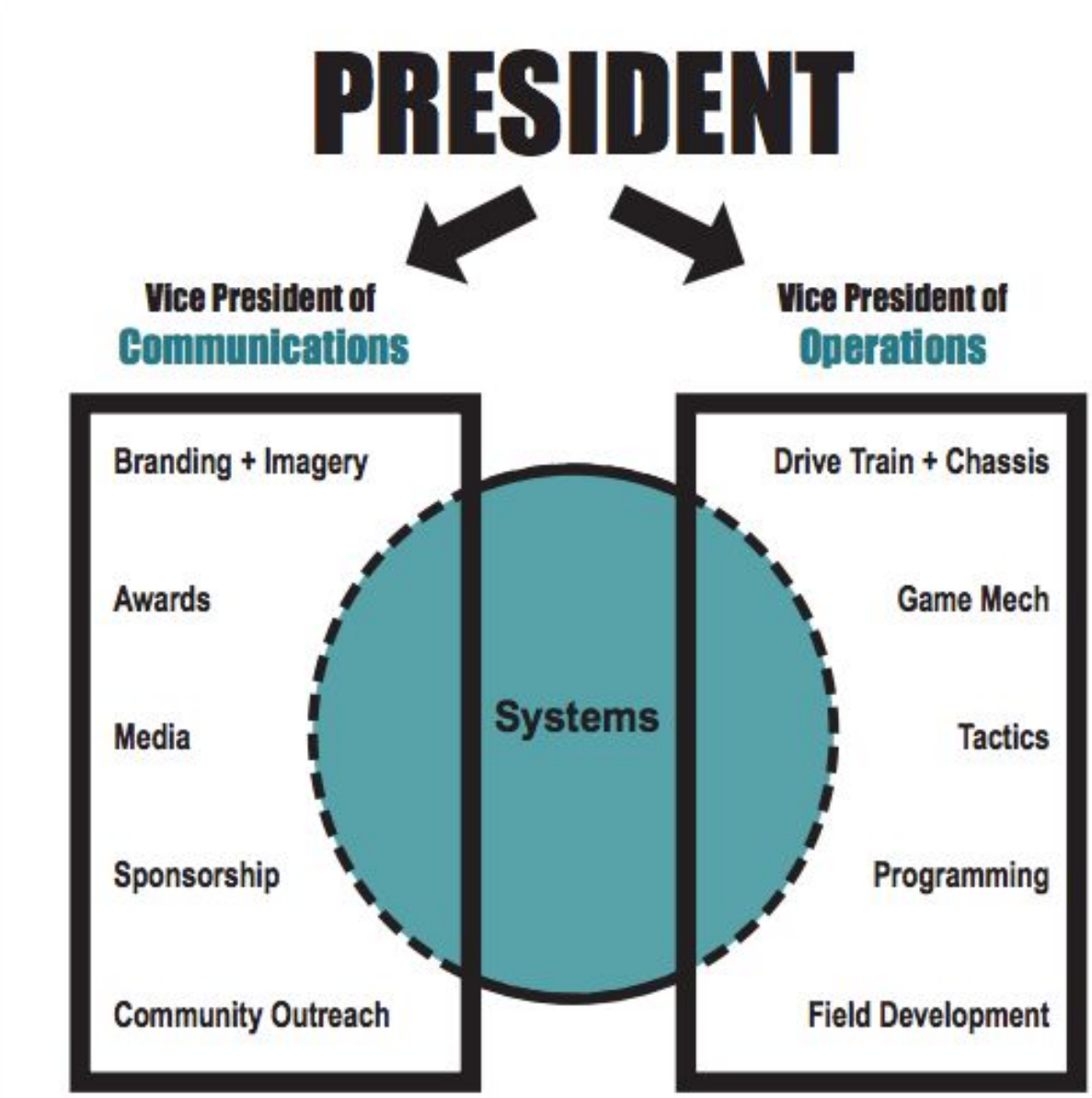
To combat the lack of communication between departments this year we created the concept of Robot Archetype Groups. A Robot Archetype Group, or RAG, comprises of a variety of students from both the Operations and Communications branches who come together to combine the priorities of their known branches into a robot design that is

ultimately presented to the whole team. Each RAG is assigned one Programmer and one Systems group member along with a blend of electrical, engineering, sponsorship, business, media, and robot design minded team members. This combination of members from different departments culminating into one group that has to work together to accomplish the same goal is something never seen before at Nicolet FEAR, or other robotics teams for that matter. Additionally this year we have implemented an online organizational structure called Bitrix24. Bitrix24 is a way to communicate and organize within your team to make sure every task is assigned to a person, who is responsible for completing that task.

Previously, each department elected a student director and student manager who would report to the President for the entire season. With this system, one or two members were in designated leadership positions for the whole season. This led to a lack of leadership experience among the team. Instead, this year, a different member is assigned to lead each new group within a sprint, which means virtually every student should obtain leadership experience at some point during the season.

Throughout the year, we inspire students to learn more about and participate in the challenges and rewards of engineering, science and technology. In our pre-season, we organize the team, prepare for build and competition season, promote our team in the community, and raise funds. At the beginning of our six week build season, we receive defined specifications from FIRST that relate to the current year's game. As teams from around the world receive these instructions simultaneously, they begin the process of designing and building their own competitive robots. During competition season, we compete at regional competitions and strive to advance towards qualification for the FIRST Championship Event.

Team Organizational Chart



Our Team's Impact & Outreach

Every community event that we are involved in, every presentation we give, and every detail of work we do, we make a strong statement about the FIRST mission and define who we are as a team. Team 4786 Nicolet FEAR strives to promote Science, Technology, Engineering, Art and Math (STEM) in the community and represent the vision and mission put forth by FIRST in our own way. We are the Future Engineers of American Robotics, building the leaders of the future and fostering a love for science and technology in today's youth. Our team provides hands-on STEM experiences and powerful education through the mentorship of engineering professionals, teachers and veteran team members. We demonstrate our organization, communication, and engineering skills at our competitions by the way we and our robot perform; In turn, we build dynamic connections with other teams through partnerships and alliances that are developed. We intend to establish Nicolet FEAR as a powerful force in the FIRST Robotics community while expressing our diligent work ethic and commitment to the program. More importantly, we expect every student member graduating from this program to walk away on a path towards success in the fields of science, technology, engineering, math, or business with meaningful and lasting relationships with teammates and mentors.

Team 4786 makes great efforts to share our program throughout the school and local community, including presentations and activities at Nicolet High School. FEAR makes well-received appearances at school board meetings to communicate the progress of the program. We frequently host facility tours during build season for school board members, high school administration, and potential sponsors. We also participate in pep rallies and the homecoming parade held by the school to share our program with our peers. At Nicolet's Fall Open House, we spread the message of FEAR and FIRST by setting up a booth and presenting to future students, friends, and community members. Each fall, we participate in our school's Thanksgiving food drive, and furthermore, we participate in the American Cancer Society's Relay for Life event, hosted by Nicolet High School in the spring which each year, students form a relay teams to raise money for cancer research. How we show our support in the relay for life, is that we get to show off our hard work postseason by providing the robot as entertainment for the participants. Our team takes advantage of opportunities to set up our pit as well as display our robot and team memorabilia throughout the year at annual fundraisers for the Nicolet High School Education Foundation. This gives the FEAR team a chance to present all that was accomplished to the school administration. One of the fundraising programs we hosted was our Halloween fundraiser, which was our first annual Board Game bonanza event.

We created an adult game night where community members and parents of team members were invited to socialize and interact with adult mentors. There were board game competitions, a raffle, and a robot driving competition. We partnered with a local restaurant to cater the event, and local businesses to donate prizes, board games and decorations. We hope for the amount of people who attend the event in the future to keep on increasing, and for the event as a whole to grow. Out of season, our team participates in the City of Glendale's 4th of July Celebration. Members and their families are invited to walk in the parade and join in demonstrations held afterwards, where community members have a chance to interact with the team and the robot. Starting this year as a community outreach event, the FEAR team is excited about its first Annual Robot Reveal. During this event we will invite friends, family, sponsors, and community members to showcase our robot and share our progress for the 2018 season. The attendees will also have an opportunity to take a photo with the robot, and talk with students and mentors about FEAR, FLL and the district youth robotics program.

Our efforts to promote STEM are evident in the participation in the engineering classes offered at Nicolet, which many of the FEAR students have taken or are currently enrolled in. It is also evident with the massive amount of participation that we have on our high school's FIRST Robotics Competition team. The largest team at Nicolet, FEAR has 65 team members this year. Another result of our efforts to promote Science, Technology, Engineering, and Math is the creation of STEM based curriculum at Nicolet, which did not even exist prior to the creation of FEAR. However, by showing the administration the importance of hands-on, project-based, and team-based science and math education, we have successfully helped our teacher mentors push for more STEM classes.

Nicolet has adopted the STEM Academy learning curriculum in our engineering department and in the upcoming next year there will be eight robotics courses allowing students to take robotics courses through their entire high school career. The robotics class now revolves around students gaining basic robotics training or enhancing the skills they already own, thus they learn design processes for simple machines and mechanisms. After they have built their robots they have a competition, simulating what would happen at a FIRST Tech Challenge, but in the classroom setting. This teaches the students the techniques of gracious professionalism, communication, and teamwork all within the school hours.

Additionally, Nicolet High School now has more engineering classes such as 3D modeling and AP Computer Science. The Design and Fabrication Lab is constantly being updated and improved as a result of Nicolet's transition to utilizing previously unused

areas of the engineering wing to create an educational space for the engineers, scientists, doctors, and entrepreneurs of the future. Because of their experiences in FEAR, senior students who have participated in the program are all prepared to launch into greater education in the realms of science, technology, engineering, mathematics, and business. Student members are positively influenced by their experience on Team 4786 Nicolet FEAR, which reinforces and expands their interest in and knowledge of these vital fields. Many of these students have been guided towards engineering and science degrees in schools such as MIT, Stanford, UW-Madison, Cornell, UNC-Chapel Hill, MSOE, and UW-Milwaukee.

In order to help younger students learn what robotics and FIRST is all about before they enter high school, Team 4786 took the lead in launching and supporting younger FIRST Lego League teams. During our team's second year, in the fall of 2013, we established two FIRST Lego League teams at one of our partner district middle schools, Maple Dale Middle School. This allowed younger students to gain hands-on experience with the mind engaged dynamics of working on a team to build a robot while simultaneously giving high school students the opportunity to share their passion and knowledge. The success of these teams, Little FEAR #1 and Little FEAR #2, prompted us to redesign the FIRST Lego League program to include even more middle schools and expand the number of teams the following year. To accommodate this growth, in the fall of 2014, we founded and mentored a Nicolet FEAR FIRST Lego League program comprised of five different teams from three separate middle schools. The four teams that Nicolet FEAR started are, Titanium Thingamajigs Team #6129, Cobalt Contraptions Team #6126, Mercury Mechs Team #6134, and Golden Gadgets Team #6132. These students work together as one group housed at Nicolet High School, and compete against each other at regionals, creating a strong and competitive STEM centered learning environment. The following year after this program was founded we added an additional team, Einsteinium Engines Team #6142. Nicolet FEAR high school students adopt the role of coaches and mentors, gaining leadership experience along the way. By inspiring this FIRST Lego League team, FEAR students serve as role models for these mini Future Engineers of American Robotics. As proof of this outstanding leadership, several FEAR students mentors for our *FIRST* Lego League teams have won the Youth Mentor Award. These awards acknowledge their excellence and dedication to the program. Enthusiastically, many students involved in our FIRST Lego League program proceed to pursue interests in STEM education, and each year, the majority of the rookies who join FEAR have participated in our FIRST Lego League program.

Team 4786 Nicolet FEAR actively seeks to participate in community events to spread the mission of FIRST to the greater Milwaukee area. During the summer break of 2014,

we had a unique opportunity to design and build a robot to throw out the first pitch at a professional baseball game. Team members committed time to strategize and collaborate on building a robot in preparation for the Milwaukee Brewers game at Miller Park. The project was primarily funded by remaining money from the prior season, and when it was finished, the robot was dubbed "Robot Yount," after the famous baseball player Robin Yount. It was designed to be shaped as a home plate, to reflect the purpose for which it was specifically created. Robot Yount could throw a pitch at 65 miles per hour using an electromagnetically fired crossbow mechanism with a pneumatics system for the drive base. Robot Yount functioned perfectly in front of a packed stadium, and additionally generated much interest and support for Nicolet FEAR and FIRST on a large scale in our community. After we threw out the first pitch, we had our pit on display in the concourse, and staffed it with team members to answer the public's questions about FIRST and FEAR, and even take pictures with Robot Yount. Members of our team were interviewed by local news stations, receiving prime time coverage to demonstrate our robot and discuss the great things our team was doing as part of FIRST. We were also recognized by Nicolet High School Administration and the Nicolet Education Foundation for our successful efforts. In addition, since it was Breast Cancer Awareness Day at the ballpark, we designed pink Nicolet FEAR team t-shirts which were sold as a fundraiser.

Nicolet FEAR team members also participate in industry conferences and network with representatives from national corporations. In the fall of 2014, team members from Nicolet FEAR were invited by FIRST to participate in the IMTS (International Manufacturing Technology Show), one of the largest technology shows in the world, held in Chicago. Nicolet FEAR participated in the FIRST booth, and helped to educate conference participants about the vision and strengths of FIRST. Our students had the opportunity to gain experience networking and promoting the value of their team, as well as the FIRST program, with experienced industry leaders and representatives from around the world, sharing how they could contribute to FIRST through sponsorship or mentorship. This was also an opportunity for our team members to educate students from other high schools about how they could start a team at their own school. We allowed participants to drive our robot, as well as robots from other teams. IMTS was truly an expansive opportunity for the Nicolet FEAR team members, helping them see how relevant their experiences on the team were for building a foundation for their future professional careers, as well as seeing the diverse and vital role new technologies will play in shaping our future.

To emphasize safety in our program, each student must scan in to the school scanners so that we can account for all members who are present that work day. Also, continuing

from other years, we still use our revolutionary Zip Tie certification system. Zip ties attach to the safety glasses to track lab certifications and different colors are associated with different tools that students have the certification to use. This system was invented by our lead mentor Adam Thiel, and has been adopted by other FIRST Robotic Competition teams as a testament to its usefulness. In the past, we have given teams battery clean up kits. This year we plan to give out Zip Tie starter kits to teams at the Heartland and Wisconsin Regionals so they can join the Zip Tie Movement. On the pit entrance there is a new strip of LEDs across the entrance. When they are green it means people can watch freely from the outside. When they are orange it means there is testing of the robot and spectators should not be near. If the LEDs are red it means there is something wrong and people should go away. In addition, we create and constantly use checklists at competition to ensure the pit and robot are safe, mentors and veterans teach students machine safety lessons, and we use safety sheets to document specific tool and machine certifications.

FEAR is so much more than just building a robot, so much more than just a team sport, so much more than just an extracurricular activity. The FIRST experience has a profoundly positive impact on our student members and mentors. For some, it opened to them the possibility of higher education to study engineering, while for others it strongly reinforces their future plans for college. For example, 90% of our seniors plan to enter a STEM field for college and or beyond. Our 2014 president, Brandon Pick, now the CEO of his own company, states: “FEAR helped my presentation skills, organization, helped improve my people skills, and also improved my approach in new challenges and completing deadlines.” Another result of the impact we have had on our members is seen with former alum Evan Rotter. FIRST did a case study on how FEAR and FIRST affected his life for the better, seen here.

Future Plans

Nicolet FEAR progressively sets and achieves ambitious goals to ensure we spread the mission of FIRST, support the continued growth and strength of our team, and build a solid foundation for a robust and expansive future. We are successfully expanding FIRST Lego League teams into middle schools to raise interest in engineering. We actively seek ways to engage current sponsors and build positive relationships with new sponsors. We raise long-term community awareness of our mission and potential, setting the stage for even more support for FIRST, Nicolet FEAR, and STEM curriculum.

To spread FEAR, FIRST, and STEM in our community, Team 4786 has been active in creating and supporting FIRST Lego League teams for students in our middle schools. In 2013, we began this endeavour by launching a team in one middle school, and have since expanded to three middle schools with a grand total of five teams. We are also defining and carrying out plans to strengthen and expand these programs. To allow students from different middle schools to collaborate with each other on teams, we launched a combined program, naming it Initial FEAR. Initial FEAR was then divided into five teams: Titanium Thingamajigs #6129, Cobalt Contraptions #6126, Mercury Mechs #6134, Einsteinium Engines #6142, and Golden Gadgets #6132.

To further pique the interest in STEM within our middle school communities, we host one-week sessions in the summer for potential FIRST Lego League students. This allows us to introduce forty new students per session to the FIRST Lego League program. The sessions simulate a mini version of a full FIRST Lego League season, with games and projects. This gives an opportunity for at least 12 Nicolet FEAR students to gain experience in mentorship within FIRST programs. In addition to the fun and challenge of hands-on engineering, the FIRST Lego League participants have the opportunity to partner with the high school team to march in the local 4th of July Parade festivities. The structure of our FIRST Lego League summer program also allows students sourced from three separate middle schools to actively engage with each other in a fun and meaningful manner. This summer program supports our enrollment in the FIRST Lego League seasons because by adding the summer participants we create a strong pool from which to recruit strong candidates. For upcoming seasons, we're planning on making videos that will introduce FIRST Lego League and FIRST to parents, administrators from middle schools, and even potential mentors.

Although we are a student-led team, our strong mentorship program allows us to bring real-world knowledge and experience into our labs in a powerful way. Mentors support our learning and practicing of skills that we will use in our higher education and our

professional lives. Mentors from our corporate sponsors like GE and Rockwell Automations as well as the community help us extend our professional network, while strengthening our team relationship with our corporate sponsors. We make a concerted effort to extend appreciation for the time and effort that our community members and corporate mentors contribute to show Nicolet FEAR's gracious professionalism.

Similarly, we proactively maintain strong relationships with our financial sponsors and keep them informed of our goals, progress, and future endeavours. We continuously spread the message of FIRST and Nicolet FEAR, inspiring and attracting positive interest. We have implemented a six points of contact approach to create but more importantly maintain relationships with our sponsors. Our six points of contact include an initial letter, follow up phone call, weekly newsletters, invitations to attend competitions, a season summary, a thank you, and offering our services to companies. To maintain physical relationships, we invite current and potential corporate and community sponsors to our visit us working in our labs as well as host tours outside of typical meeting hours. Additionally, each student is versed in Nicolet FEAR's elevator speech and encouraged to share their passion and enthusiasm within their school and community.

Team 4786 Nicolet FEAR created a steering committee in May 2014 to provide financial stability and create a sustainability plan. The committee consists of administrators, teachers, and community stakeholders who meet regularly to discuss long term sponsorship opportunities and educational applications of Nicolet FEAR. The main function of the committee is to create a growth plan for Nicolet FEAR in terms of financial and human resources. We seek to involve college professors, as well as partner with local businesses for financial stability and growth.

The mentors and students of Nicolet FEAR have encouraged Nicolet High School to make great strides in developing a more rigorous STEM learning program to acknowledge the academic interests of students who love science, technology, engineering, and math. By increasing the amount of STEM curriculum at Nicolet, Team 4786 will have more future participants with the interest and skill sets to aid in our continued growth and development. Nicolet FEAR also encourages our alumni members to continue their education and careers in areas of STEM so that they can hopefully return to support the team as future mentors.

We are constantly improving our planning, structure, communication, operations, and workflow. Learning from initial communication issues we experienced as a young team, we sought solutions our successful Agile Development Process from previous years.

Since then, we have moved on to a different process, using Robot Archetype Groups and design reviews to effectively adjust and communicate between Work Groups.

We strive to spread the ideals of FIRST, FEAR, and STEM learning by being more involved in the community, hosting demonstrations, expanding our FIRST Lego League teams, including middle schools in our program, and inviting more sponsors, scout troops, or anyone who is interested in learning about FEAR and the message of FIRST. For as long as we are a team, we will continue to spread the philosophy of FIRST while simultaneously growing interest, excitement, and passion for STEM fields and careers.

During the preseason of our fourth year, members began the RoboKnight project, named after our school's mascot the Knight. RoboKnight is a robot that can shoot t-shirts. In the future, RoboKnight will attend school sporting events, pep rallies, or other community activities, helping us spread interest in and excitement for FIRST, robotics, and STEM initiatives. During the summer session of our sixth year, we created three drive trains, built a new battery cart, and reorganized our storage areas.

Team Risks and Risk Management

STRENGTHS

- Large team
- Cross trained students
- Student-led team
- Diverse membership
- Diverse sponsor base
- Well-rounded teacher and community mentors
- School and administrative support
- Excellent safety protocol
- Dedicated building/lab space
- Successful recruiting program including middle school programs

WEAKNESSES

- Large number of rookie/young members
- Critical skill training needed for students
- Not enough eligible students for Varsity/Travel
- Lack of Communication

OPPORTUNITIES

- Securing Sponsors
- Recruiting trained mentors
- Interest in STEM
- Business/University Partnerships
- Presentations/Demonstrations to School Board & Potential Sponsors
- Revitalized school broadcasting program

THREATS

- Loss of Mentors
- Loss of Sponsors
- Loss of Student Interest
- Loss of School Support

Based on techniques businesses use, we adopted Bitrix24, a digital program that allows us to add tasks that any team member can join. Unlike our old AGILE scrum method, Bitrix24 makes it easy to view previous tasks, reference old methods, and improves communication and data collection. To prevent specialization in a single field, each student works in Communications and Operations. We run a rookie bootcamp to teach

new members about FEAR & FIRST, and hold basic skill development & safety training for all members during preseason. We pair veterans with rookies to help the latter learn the necessary skills to complete tasks. Students help other students study and do homework to raise their grades so they will be eligible for varsity/travel.

Contingency Plans

Our contingencies for the unlikely but noteworthy threats listed in the above S.W.O.T. analysis are as follows:

If we lose **all of our team's teacher mentors**, we will reach out to our founding teacher mentors who are still teaching at the school and are still great supporters. Also, alumni members, such as our 2014 president who has now founded his own company, and technical mentors who are parents of students on the team would help. We would also reach out to other FRC teams in our area for support.

Another threat is the loss of a **significant sponsor**, which we've already overcome this season. We had a sponsor that pledged $20,000 for three consecutive seasons to help us establish ourselves. With the loss of that sponsor, we have had to find funding to replace that financial support. We implemented the six points of contact system which has dramatically improved our sponsor approach and resulted in more money raised this year than we have ever raised before. We also have a steering committee comprised of mentors, school board members, and representatives from the business community.

To prevent **loss of student support**, we are expanding our FLL program, readying more students to join FEAR. We travel to different classrooms and make posters to advertise FEAR. We participate in pep rallies, open houses, and homecoming parades as well as other events in our local community, therefore getting students interested in joining our program.

If we **completely lost support from our school,** we would reach out to mentors for a new facility, and restrict our budget on both branches of the team. Thankfully we have a fantastic relationship with our school and school board, hosting them for tours and inviting them to competitions regularly. We also ensure that all members maintain strong grades and respect the school's facilities and rules.

Team Budget

NICOLET FEAR BUDGET 2017 - 2018			
REVENUES	**DETAILS**	**PROJECTED**	**ACTUAL**
School Contribution		**$54,900.00**	**$54,943.00**
Corporate Sponsors		**$25,000.00**	
Rockwell Automation	$2,500.00		**$2,500.00**
GE Healthcare	$2,500.00		**$1,100.00**
Johnson Controls	$2,500.00		**$3,500.00**
Snap-On Tools	$2,500.00		
Todd's Tools LLC	$5,000.00		**$10,000.00**
MSOE	$500.00		
Lippman-Jungers	$5,000.00		**$5,053.31**
NASA	$1,000.00		**$0.00**
Astronautics	$1,000.00		**$0.00**
Lab Midwest	$1,000.00		
Wisconsin Robotics Grant	$1,000.00		
Right Now Marketing	$500.00		
Donations		**$20,000.00**	**$204.00**
Student Team Fees		**$6,000.00**	**$6,590.00**
Fundraisers		**$6,000.00**	
FEAR Gear	$2,000.00		
Board Game Bonanza	$4,000.00		**$4,142.00**
TOTAL REVENUE		**$111,900.00**	**$88,032.31**
EXPENSES	**DETAILS**	**PROJECTED**	**ACTUAL**
Registrations		**$14,500.00**	
Off Season	$500.00		**$450.00**
Wisconsin	$5,000.00		**$5,000.00**
Northern Lights	$4,000.00		**$4,000.00**
World Championships	$5,000.00		
Scholarships		**$1,500.00**	

Senior	$500.00		
Sponsor	$1,000.00		
Team Travel		**$33,500.00**	
Wisconsin (In State)	$3,500.00		**$213.96**
Heartland	$14,000.00		**$14,175.00**
World Championships	$16,000.00		
Special Projects		**$25,000.00**	
Fundraiser	$5,000.00		**$5,125.95**
Router Table	$9,235.00		**$9,235.00**
Battery Cart	$1,600.00		**$1,349.14**
RoboKnight	$2,000.00		**$889.47**
FLL	$4,465.00		**$3,080.91**
FEAR Gear	$2,000.00		
Underground Cave	$700.00		**$859.88**
Team Building		**$2,000.00**	**$250.00**
Team Celebrations/Meals		**$2,500.00**	**$976.82**
Student Materials		**$5,000.00**	**$397.00**
Project Areas:		**$23,000.00**	
Awards	$750.00		**$969.98**
Capability Development	$3,500.00		**$4,603.03**
Combine	$3,000.00		
Competition	$1,500.00		
Field Prep	$1,000.00		**$423.90**
Imagery/Branding	$2,500.00		**$1,927.08**
Off Season	$500.00		
Robot	$8,000.00		**$5,590.05**
Skill Development	$1,000.00		
Sponsorship	$1,250.00		
Miscellaneous		**$3,000.00**	
TOTAL EXPENSES		**$110,000.00**	**$59,517.17**
TOTAL BALANCE			**$28,515.14**

Marketing Strategy

Our marketing strategy seeks to develop a consistent message and brand for our team while promoting Team 4786 Nicolet FEAR and FIRST to sponsors, our community, and students who may be interested in participating, other FIRST teams, and the general public. Nicolet FEAR raises money and spreads the word about our program and the mission of FIRST, aiming to train the technological leaders of the future, and exemplifying the objectives of this mission. We also spread this message face-to-face at local businesses like Hainbuch America, Snap-On, Best Buy, and Foresite Group. We have contacted over 100 businesses and individuals, receiving financial and in-kind support that we might not have gotten otherwise. With our message in mind, we build connections with other local FIRST Robotics Competition teams.

Branding

Members of our branding and imagery work groups are responsible for creating the design aspects of Team 4786, but all members of the team are responsible for implementing said design aspects. To create our brand, we have developed a consistent color scheme, logo and fonts that flow through our website, shirts and other gear, posters, buttons, pit design and other materials that reflect Nicolet FEAR. Our colors are black, white, grey, and teal, which we refer to as "FIRSTY Teal." Our logo and mascot, which we fondly call FIRSTY in honor of FIRST, is a robot made out of circles, triangles, and squares, the three shapes in FIRST's logo. Nicolet FEAR's mascot FIRSTY was created by students with the help of one of our teacher mentors, Mr. Medved. Every year, our students create new designs to put on buttons, T-shirts, and other FEAR gear that involve the current year's game. This year our students created posters in the style of classic video games, all featuring FIRSTY.

Promoting Key Messages

The enthusiasm and knowledge of our team members is an integral part of our marketing strategy. At the beginning of the year, the students collaborated to write an elevator speech succinctly explaining the key aspects of both Team 4786 and FIRST to be delivered in 2-3 minutes. In addition to all team members being ready and eager to spread the word about Nicolet FEAR and FIRST at any time, they proactively promote our brand to potential sponsors. Our students host tours so businesses and individuals in the community can see each project group collaboratively working towards their goals.

Recruiting New Members

To market the opportunities and excitement of Team 4786 Nicolet FEAR to rising high schoolers, we hold open houses at Nicolet High School and encourage graduates of our 5 FIRST Lego League teams to join FEAR. We also implemented a rookie boot camp to allow interested high school students to gain hands-on experience of how fun, rewarding and challenging being part of Team 4786 is. We pair veterans and rookies within each department, which helps rookies learn the necessary skills to complete tasks within the lab and in the relations branch. In addition, we participate in community events in our area to spread the message of FIRST and FEAR.

Sponsorship

A key aspect of the FIRST process is forming partnerships in the community. Through personal connections and communication with corporations, we have received financing and equipment from multiple community sponsors and FIRST sponsors including Rockwell Automation, NASA, Johnson Controls, GE Healthcare Volunteers, Snap-on Tools and the Nicolet Foundation. We receive generous sponsorship from our high school who has a commitment to let us use the school's facilities, support us financially by including half of our operating budget in the school's annual budget, provide 5 paid teacher-mentors, and allow us to become an integral part of our school culture with varsity letter status. Because of the relationship we have maintained with one of our main sponsors, Snap-On Tools, they began to cultivate relationships with high schools as clientele; before they sponsored us, they typically did not sell their tools to high schools or other robotics teams in the area. Todd Gaulke, our Snap-On Tools mentor, states that he would recommend to other Snap-On franchisees to expand their client-base to high schools because of his successful relationship with our team.

Students in Communications work groups meet with potential donors in person and make contact by phone to establish a foundation of strong and genuine relationships with our sponsors. We value making these strong connections early to ensure that the mission statements of FIRST and FEAR are communicated clearly and understood by everyone we contact. We have implemented a 6 points of contact approach to create and maintain relationships with our sponsors: an initial letter, follow up phone call, weekly newsletters, invitations to attend competitions, a season summary, a thank you, and offering our services to companies. Spreading our message throughout the community is a key to success. We received funding and in kind donations from several sponsors, expanded our team, and paved our way toward success in competition. Several sponsors also provide us with exceptional mentors, strengthening our partnership.

Team 4786 Nicolet FEAR has three different kinds of sponsors: Corporate, Educational, and Individual. Each group has its own page on the website with all the levels of sponsorship listed below. We have five different levels of sponsorships, dependent upon the amount of their donations. The levels begin at bronze, and extend through silver and gold to our highest competitive level. Our top sponsor has naming rights to the highest sponsorship level, dedication at end of season banquet, receives a Team Award plaque, and a photo opportunity with team members on the competition field. In 2016, our top sponsor was Todd's Tools, LLC so the current name of the top level is The Todd Gaulke.

Our financial sponsorship levels are as follows:

Up to $499 - Bronze Level

- FEAR recognition plaque
- Logo on FEAR website for season
- Size A Logo on publications/media

$500-$1,999 - Silver Level

- Name on Game shirt for season
- FEAR recognition plaque
- Logo on FEAR website for season
- Size B Logo on publications/media/robot/products/trailer

$2,000-$4,999 - Gold Level

- Name on Game Shirt for season
- FEAR recognition plaque
- Continuous recognition through social media
- Logo on FEAR website for season
- Size C Logo on publications/media/robot/products/trailer

$5,000+ - Diamond Level

- Name on Game Shirt for season
- FEAR recognition plaque
- Continuous recognition through social media
- Logo on FEAR website for season
- Size D Logo on publications/media/robot/products/trailer

$11,352.85- The Todd Gaulke (competitive top level)

- Each year the highest sponsor gets naming rights to the highest sponsorship level.
- Dedication at end of season banquet
- Team Award plaque
- Photo opportunity with team members on the competition field
- Name on Game Shirt for season
- FEAR recognition plaque
- Continuous recognition through social media
- Logo on FEAR website for season
- Size E Logo on publications/media/robot/products/trailer

For More Information

Our Facebook:
Nicolet FEAR

Our Website:
www.nicoletfear.com

Our Twitter:
@NicoletFear

Our Instagram:
@nicoletfear4786

Our Email:
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