



THE GREEN MACHINE

Edina Robotics *FIRST* Team 1816 - The Green Machine

Team Handbook

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Team Overview

Edina Robotics *FIRST* Team 1816 - *The Green Machine* - is a wholly-endorsed activity of Edina High School, complete with Minnesota State High School League sanction. The team is comprised of students in grades 10 – 12, where members will learn skills one year, apply those skills the following year, and pass on their knowledge in their last year (the "see one, do one, teach one" approach). With the guidance of adult mentors and volunteers, the team builds a robot to compete in the *FIRST* Robotics Competition. Team 1816 supports itself by raising funds through corporate sponsorships as required of all *FIRST* teams. Tax-deductible donations to the team are accepted via the Edina Education Fund. The team does not receive any direct funding from Edina Public Schools.

FIRST stands for "For Inspiration and Recognition of Science and Technology." The *FIRST* mission (www.usfirst.org) is dedicated to changing the way high school students regard education and careers in science and technology. The intent is to inspire an appreciation for the real-life rewards and career opportunities in these fields by challenging students and their adult mentors to solve an intense engineering design problem. In 2016, more than 78,000 high school students will be placed on 3,100+ teams throughout the world. There are 56 regional events, including four in Minnesota, and a Championship competition. There is also a State Championship sponsored by the MSHSL. The competitions are high-tech spectator sporting events, the result of brainstorming, teamwork, mentoring, and project deadlines.

The Green Machine is active throughout the entire year. The team begins its season in the summer by securing funds to pay for the costs of a robot starter kit, regional competition fees, robot parts, tools and materials, and outreach events. During the fall months, the team organizes and holds outreach events as well as preparation sessions to help familiarize all members with the tools and software they may be using. At a *FIRST* kick-off event in January, the team learns the competition game scenario and game rules. The team has only 6 weeks to complete a robot to play the year's game. Using a *FIRST*-provided kit of parts including motors, sensors, cameras, and electronics, as well more than \$9,000 of additional purchased materials, the team designs, builds, and programs a full-scale, 120-pound+ robot.

A *FIRST* regional competition brings together as many as 63 high school teams and their robots at a coliseum-type facility for three days. The facility holds spectators, an arena for the robot competition, and a "pit area." The pit area provides each team with a 10' x 10' station to fine-tune their robot between events. Teams compete with and against each other using their robots to play the game.

The team completes their season in the spring with a follow-up to their corporate sponsors. Various activities and events are planned throughout the summer, including fundraising, in preparation for the next competition season. Please see our "Team History" later in this handbook.

FIRST Mission Statement

"To transform our culture by creating a world where science and technology are celebrated and where young people dream of becoming science and technology leaders."

- Dean Kamen, Founder, US *FIRST*

FIRST's mission is to inspire young people to be science and technology leaders, by engaging them in exciting mentor-based programs that build science, engineering and technology skills, that inspire innovation, and that foster well-rounded life capabilities including self-confidence, communication, and leadership (www.usfirst.org).



FIRST TEAM 1816 Mission Statement

The mission of Team 1816 – The Green Machine is to build and maintain a strong foundation of *FIRST* in Minnesota. As the oldest enduring team in the state, we strive to use our experience to empower other teams with resources and knowledge in order to nurture and expand *FIRST*. Our goal is to bring the message of *FIRST* to new audiences, and to ensure every team in the *FIRST* family of programs has a great *FIRST* experience. We hope to inspire everyone to share our enthusiastic pursuit of all things science, technology, engineering and math.

Member Requirements

Expectations of Student Members

The Green Machine is about more than building the robot for six weeks out of the year: It's about taking part in all of the activities that help to make The Green Machine a premier team in Minnesota and beyond. Accordingly, the expectation is that team members will attend scheduled meetings, workshops, seminars, and outreach events. While your academic and family obligations come first, meeting your obligations to the team may mean re-arranging your schedule to be able to participate in community service, training, mentoring, outreach, and other activities. To get the most out of what *FIRST* Robotics has to offer, and to be a team member that others can count on to contribute to the team's success, every team member needs to commit to making full participation in team activities a priority.

Student Eligibility

1. Students must be an Edina High School student.
2. Students must maintain a minimum of a C- average.
3. Students are expected to make a significant time commitment to the team, actively participating in meetings, workshops, and events. Commitment to the team increases substantially during the months of January – May.
4. Students are expected to be reliable (on-time, prepared to work, clean up, positive attitude, assist newer members, responsive to mentors and other adult volunteers) and assist with team administrative tasks.
5. Students and parents must complete all required and necessary registrations with Team, *FIRST*, and Edina High School, and pay all required fees including the annual registration fee, team apparel costs, and travel expenses.

Code of Conduct

“Gracious professionalism,” one of the founding precepts of *FIRST*, is essential to team participation. “It’s a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community” (www.usfirst.org). The following Code of Conduct describes standards of behavior applicable to all team members, and is intended to create an environment that encourages gracious professionalism. Violations of the Code of Conduct are subject to disciplinary action, to be determined by the team’s lead mentors and EHS Administration, which may include suspension from team activities, ineligibility to travel with the team, or removal from the team.

1. Students will display “Gracious Professionalism” at all times and promote the ideals of *FIRST*.
2. Students will sign an agreement and follow the same rules as dictated by Edina High School and the Minnesota State High School League, including those in regards to alcohol and chemical substances.
3. Students will not violate the racial / religious / harassment / violence / and hazing bylaws of the Minnesota State High School League (See Eligibility Rules at <http://www.mshsl.org/mshsl/publications.asp#2>). Students will behave in a courteous and cooperative manner, especially when in public, visiting corporate offices, presenting to sponsors, and during outreach events and activities.

4. Students will be respectful of others and behave in a way that does not endanger the health and safety of themselves or others.
5. Students will be respectful of the facilities, tools, equipment and all things being used by the team.
6. Students shall not use profane, obscene or vulgar language in written, gestured, or verbal form. Edina Robotics abides by Edina Public School's Acceptable Use Policy for all communications, including all social media and Internet usage..
7. Students will keep current with team activities and requirements by checking the website and their email frequently.

Lettering and School Recognition

1. The faculty advisor, with input from all team mentors, will determine which students receive an Edina High School letter and/or school and team recognition awards.
2. Students must be an active participant of the team (contributions to subteams, significant participation at team events is expected, as is communication with leaders and mentors).
3. Students must be a member in good standing for each of **two** years.
4. At a minimum, students must attend one competition approved by the Faculty Advisor (other than Championship), **in its entirety** for each of the two years.
5. The faculty advisor has total discretion on all lettering decisions.

Team Organization

Faculty Advisor:

- A teacher and/or Edina High School-appointed adult who acts as the liaison between the team and the school.
- Monitors the standing of each member (grades, behavior, and attendance).
- Communicates to the schools and schedules school facilities.
- Assists with grant proposals.
- Coordinates yearbook page with school yearbook staff.
- Determines appropriate school and team recognition awards.
- Supervises team activities.
- Serves as "alternate contact" with *FIRST* organization.
- Serves as "shipping contact" with *FIRST* organization.
- Maintains open communication with parents, mentors and students.
- Coordinates parent and adult volunteers for team activities.
- Coordinates mentors for build and subteam meetings.
- Supervises travel plans for team.
- Co-signer on team checks.
- Supervises handbook updates.
- Maintains registration, attendance, safety contracts, and other private student records.

Operations Director:

- Chief mentor to the team (both robot and business operations).
- Supervises technical mentors.
- Co-signer on team checks.
- Is present at competitions and other *FIRST* events.
- Coordinates with Faculty Advisor, Communications/ Team Manager on all things detailed regarding *FIRST*.
- This handbook may not contain all possible team procedures and processes, nor can it address all situations coming before the team; the operations director is entrusted with ensuring that there are responsible adults overseeing the ongoing operations of the team.
- Chief arbiter of all team business. Has final approval of all official team communications and functions (including videos and outreach).

Communications - Team Manager:

- Primary contact with *FIRST*.
- Primary contact with *FIRST* Minnesota Regional Planning Committee.
- Submits registration for *FIRST* events.
- Distributes *FIRST* information to appropriate adult and student team members.
- Oversees communications with community and business partners.
- Maintains team email distribution lists and rosters.
- Maintains team history
- Maintains team budget and finances.
- Coordinates travel and oversees budget
- Coordinates team communications, calendar and schedule.
- Works with students and mentors to update team media, including team website, social media pages and marketing materials.
- Coordinates building requests with Edina School District.

Technical Mentors:

- Adult volunteers with an engineering or technical background.
- Provide professional expertise and supervision.
- Guide and teach students new skills.
- Mentorships must be approved by the Faculty Advisor, the Operations Director and the Communications-Team Manager.

Non-Technical Mentors:

- Are adults that direct the team in business, marketing, and media.
- Provide professional expertise, guidance, supervision, or training to students.
- Mentorships must be approved by the Faculty Advisor, the Operations Director and the Communications-Team Manager.

All Parents:

- Are expected to provide additional support of the team, including chaperoning, making travel arrangements, providing meals, transportation (people and robot), general supervision (non-mentorship), donation of general supplies/snacks/water, craft-type expertise (including sewing) and assisting team mentors as requested.

All Adult Volunteers:

- Must have a current background check on file with the Edina School District.

Sponsors:

- Are corporations and individuals that contribute funds, services, supplies, or support to the team.

Team Captain(s) and Subteam Leaders:

- Are students that lead a group of students on a subteam.
- Are expected to attend all team competitions.
- Attend mentor/student leader meetings.
- Mentor junior team members and set a good example.
- Bring problems to the attention of adults.

Selection of Leadership

Team members interested in leadership roles should express their interest to the Team captain(s), who will present all such candidates to Team mentors and graduating seniors. All candidates must be team members in good standing. The leadership of Team 1816 will be determined by the Team mentors with input from the graduating senior class. The Assistant Captain/s position is unique. The individual/s will make a unique two-year commitment to the Team as a “shadow” the first year and Captain/s the second year. All other positions are for a single year/season only and must be renewed annually. The Captain is not re-voted on in his/her second year. Further, it is strongly recommended that a candidate for subteam leader have served on that subteam in the past. Subteam leaders and team members are divided into subteams based on their interests and expertise. Subteams are developed based on the size of the team, the nature of the year’s competition, and the availability of mentors. Returning team members are placed onto subteams before new team members are placed. New members will be placed on subteams based on an application and interview with the Faculty Advisor, the Operations Director, and team leadership as selected by the Faculty Advisor and the Operations Director. All team placements will be based on availability of positions.

Description of Leadership, Subteams

Captain/s

- Represent Team 1816 in all official capacities, including *FIRST* competitions. Is chief spokesperson for the Team. Supervises all business and build activities.
- Run meetings
- Make executive decisions
- Coordinate with mentors regarding shipping arrangements
- Keep track of what needs to be done for build including monitoring of *FIRST* manuals
- Prepare BOM – the Bill of Materials (a complete listing of all robot parts and supplies and their exact cost) for *FIRST* competitions and present this BOM at competitions
- Maintain software licensing in coordination with mentors
- Supervise robot build
- Coordinate projects and communications with subteam leaders
- Maintain ongoing email correspondence to team members and to sponsors and other third parties
- Coordinate and communicate regularly with team mentors
- Include team’s faculty advisor, operations director and mentors in all team decisions.
- Time Commitment: All team meetings; all build days; minimum of 7 hours on *FIRST*-related business weekly, more during build period; all outreach events.

Assistant Captain/s

The assistant captain/s position is a two year commitment - 1st year as assistant captain and 2nd year as team captain.. During the 1st year, the assistant captain/s "shadows" the captain/s to understand the duties and obligations of managing the team.

- In the absence of the captain, the assistant captain/s will represent the team.
- Serve as team treasurer
- Take meeting minutes and work with communications mentor to distribute to team
- Lead and manage team’s corporate sponsorships and funding efforts
- Develop and maintain relationships with the team’s sponsors
- Maintain team’s brand identity across all media including website, printed materials and digital presentations
- With Business and Outreach Subteam Leader/s, coordinate team members on team branding, image, presentations, marketing materials, newsletters, videos and giveaways
- Coordinate competition positions in consultation with lead mentors
- Help organize Outreach and other events, activities

- Order parts, tools and equipment and learn how to create/present Bill of Materials with Captain/s and Build subteams
- Supervise subteam leaders
- Maintain ongoing email correspondence
- Time Commitment: All team meetings; all build days; during non-build season about 7 hours per week; all outreach events.

Safety Captain - *This position is required by FIRST for all FRC Teams.*

<http://www.usfirst.org/roboticsprograms/frc/safety-video-and-manual>

- Plan, create, and present annual team safety seminar and supervise quizzes
- At competitions, represent Team to UL in position of Safety Captain
- At all competitions, monitor pit safety and proper tool use
- Distribute and collect safety glasses; insure safety glasses are packed for outreach events and competitions.
- Buy safety glasses and other safety equipment, including fire extinguishers, as needed
- Monitor websites (*FIRST*, Chief Delphi) for vital information
- Coordinate safety of tools and oversee tools management.
- Download and print-out current year safety manual, including safety (MSDS) information about batteries. This information should be available in the workshop and at competitions as part of information shared with Judges and UL.
- Coordinate work with Facilities subteam on safety plan/equipment for pit; supervise the safety of the workshop during build sessions.
- Return Safety Captain Notebook to Communications-Team Manager at end of season.
- Time Commitment: All team meetings, safety seminar plan and execution takes 8-10 hours, supervision of workshop safety during build intermittent 2-3 hours/week; attend all competitions, and outreach events.

Build Leader (Chassis and/or Manipulator, as needed)

- Leads design, construction, and maintenance of the robot's drive-train and manipulator systems. Monitors Web sites (*FIRST* and Chief Delphi) for vital information and weight control of the robot.
- Organize and supervise meetings of chassis (drivetrain and frame) and manipulator (including sensors, pneumatics) subteams, as needed
- Use online spreadsheet to track purchases and prep for Bill of Materials
- Supervise work in pit during competitions in coordination with Safety Captain
- Coordinate & supervise building of the robot
- Monitor weight of robot
- Keep current with Chief Delphi, The Blue Alliance, and other pertinent web communications
- Maintain an ongoing list of materials used in building of robot in preparation for *FIRST* Bill of Materials (a complete listing of all robot parts and supplies and their exact cost) for *FIRST* competitions
- Insure BOM is packed along with tools for competitions (hard copy and on flash drive)
- Maintain a build schedule and keep subteam to the schedule through supervision and communication
- Coordinate with mentors
- Work closely with CAD and Programming subteams.
- Time Commitment: All team meetings, coordinating and supervising summer practice build, summer workshops/trainings, all build sessions – full time; busy with coordination of activities and communication all year round 2-3 hours per week, outreach events.

Business and Outreach Subteam Leader/s

- Promotes inspiration of technology and engineering through various activities.
- Coordinate events, seminars, and activities to raise awareness of *FIRST*

- Coordinate assistance to other FRC, FTC and FLL teams.
- Organize and supervise outreach events and projects
- Acquire and maintain Corporate Sponsorships; maintain communications with assistant Captain in charge of treasurer. The treasurer function is carried out by an assistant Captain
- Contributes to Award submissions (may include essay, scripts, and visual aids).
- Coordinates team photography, team videos, oversees website.
- Coordinate Team's digital presence with webmaster (adult mentor who helps administer Team's website) and members contributing to social media pages, including Facebook, Twitter, YouTube.
- Supervise and contribute to team's social media presence
- Coordinate the production of marketing and other promotional videos
- Oversee Team branding, including apparel and giveaways
- Time Commitment: All team meetings, year round Business presentations and Outreach activities. Can be up to 4-6 hours per week, year-round, plus time at events and activities.

CAD (Computer-Aided Design) Subteam Leader

- Leads design of robot's structure, creates CAD models of design, aids in design process, assesses feasibility of design choices, simulates motion and analyzes weight of robot.
- Give vital input into robot design
- Model robot using PTC CREO design software
- Help construct prototypes
- Supervise subteam meetings
- Create CAD design notebook and produce presentation, hard-copies for competitions
- Keep current with Chief Delphi and other *FIRST*-related websites
- Assign students to communicate with Build and CSP
- Time Commitment: All team meetings, every build session, CAD training during the summer, work with practice robot in summer, outreach events.

Control Systems & Programming Subteam Leader

- Ensure all programmers learn how to program and participate in programming the robot
- Oversee Robot Programming, especially at competitions
- Designs and builds robot electronics, wiring, circuitry, and sensor systems. Develops and updates robot computer programs (C++, LabVIEW, Java, et al).
- Plan and supervise subteam meetings
- Keep current with Chief Delphi
- Work on wiring in conjunction with Build subteam
- Wire and program practice robot
- Maintain communication and/or assign subteam members to maintain communication with CAD and Build subteams, both verbally and electronically.
- Time Commitment: All team meetings, summer programming workshops and practice robot build sessions, weekly subteam meetings until build; then 4-5 days a week during actual build; attend outreach events.

Facilities Subteam Leader

- Interprets *FIRST*-supplied blueprints of the playing field and builds parts of the field according to those specifications.
- Designs, builds, and sets-up pit area at competition.
- Constructs shipping crate.
- Organize and supervise design and build of all non-robotic materials including: crate, pit, and practice field; design and construct bumpers for robot; manage workshop and inventory of tools; coordinate with marketing the pit design regarding, and placement of, corporate logos on robot.

- Time Commitment: All team meetings, during summer and fall 2-3 hours per week on pit and crate, during the build season all build sessions until field and crate are constructed, and final pit is designed and ready; outreach events.

Scouting & Strategy Subteam Leader

- Organize pre-scouting activities
- Develop scouting database and data collection system
- Assign and coordinate scouts during competitions
- Monitor The Blue Alliance, The Red Alliance, Chief Delphi, and other *FIRST*-related websites and Forums
- Prepare database of teams/capabilities during competition
- Prepare/deliver scouting report
- Stay current on all game rules and communicate information to team
- Time Commitment: Preparation begins when teams are posted on rosters for each competition. 4-5 hours per week prep ahead of regional competitions and more for the national competition. Attend all competitions and outreach events.

Business and Outreach at a Glance

Outreach	Promotes technology and engineering through various community activities. Coordinates events, seminars, and activities to raise awareness of <i>FIRST</i> ; and assists other FRC, FTC and FLL teams. Includes organization of team activities and fund-raisers outside of corporate sponsorships. Includes mentoring of other <i>FIRST</i> teams.
Business	Responsible for soliciting sponsors. Maintains sponsor relations and recognition before, during, and after the building phase (see detailed sponsor information). Prepares grant proposals, and obtains other commercial donations of supplies and services. Produces marketing collateral materials, including logos, t-shirts, team giveaways. Supervises team brand identity, including team apparel, t-shirts and mascot.
Treasurer	Assigned as part of the Assistant Captain/s duties, working in conjunction with faculty advisor and team manager.. Edina High School requires our Team to have a student in the position of treasurer.
Media	Media is a vital part t of the Business and Outreach Subteam. Media projects include graphic design, digital photography, video production, website design and updates, and social media. Members develop, maintain, and submit media projects for competition entry.

Build at a Glance

CAD	Responsible for design of robot's structure, creates CAD models of design, assesses feasibility of design choices, simulates motion and analyzes weight of robot. Interfaces with 3D printing sponsor.
Robot Build	Responsible for designing, constructing, and adjusting the robot's drive-train system and the skeletal structure of the robot. Monitors Web sites (<i>FIRST</i> and Chief Delphi) for vital information and weight control of the robot. Responsible for the design, building and incorporation of any manipulators (including pneumatics) and sensors on the robot.
CSP, electrical, sensors and programming	Control Systems and Programming, responsible for electronics, wiring, circuitry, and sensor systems. Develops and updates robot computer programs.
Facilities	Interprets <i>FIRST</i> -supplied blueprints of the playing field and builds parts of the field according to those specifications; designs and sets-up pit area at competition. Constructs shipping crate. Manages and maintains school workshop area and team tools.
Safety	Safety captain and designated team members monitor competition manual for robot compliance and safety considerations. Coordinates team's annual safety seminar. Monitors Web sites (<i>FIRST</i> and Chief Delphi) for vital information, tools management & inventory of parts.
Strategy & Scouting	Includes game rule monitor(s), provides competitive information for the competition team prior to and during competition, and develops scouting database and data collection system.
Spirit	Leads spirit at competition, including team peer-to-peer interactions, dancing, and mascot duties.

Team Organization – During Competitions

Pit crew positions	<p>For Safety purposes, only 5 students may be in the pit at one time. Students may rotate in and out of the pit, as needed.</p> <ol style="list-style-type: none">1. Mentor (type will vary).2. Safety Captain – student in charge of safety glasses, cleanliness of pit, keeping aisles clear, monitoring persons in the pit.3. Mechanical – student(s) in charge of drive-train, chassis and manipulator.4. CSP/Electrical– student(s) in charge of electrical pre- and post-match checklist as well as keeping batteries charged.5. CSP/Programming – student programmer responsible for system checks and programming changes.6. Runner – student designated to acquire any items needed including tools, parts, help, etc. Aids with communications in and out of pit and rotation of pit crew.
Field crew*	<ol style="list-style-type: none">1. Driver – student operating the robot using the remote controls.2. Coach – student providing feedback during the game.3. Human player – student participating in the game as a human player.4. Other (such as robot accessory/manipulator operator). <p><i>*Field Crew will be determined by pre-competition try-out, possibly using the previous year's robots.</i></p>
Media crew	<ol style="list-style-type: none">1. Digital photographer2. Videographer3. Social Media coordinator
Pit Representatives	<ol style="list-style-type: none">1. Pit reps –Talk to judges2. Chairman's Award – 3 students responsible for 10 -minute presentation, Q&A (may be separate from Pit reps)3. Safety Captain – Reps team to UL Safety Advisors (safety outreach, procedures)
Strategy, Scouting and Spirit Crews	<ol style="list-style-type: none">1. Strategy Lead – coordinates scouts, reviews data, and presents conclusion.2. Data input – updates data from scouts into a database, as needed.3. Scouts – watch matches and collect needed information.4. Robot Documenter – photographs and collects basic data on all robots at the competition.5. Mascot - wears costume, leads cheers.6. Peer-to-Peer Awards – Distribution of Peer to Peer Awards (be <i>FIRST</i>) as needed.7. Team representatives as requested by <i>FIRST</i> as guides and hosts to visitors.

FUNDING AND FINANCIALS

FIRST requires its teams to secure funding from corporations and other business sponsors. As such, funding for the Edina Robotics Team comes from these sources:

1. Corporate and Educational Sponsors – corporations, education-related and other non-profit organizations that donate funds. This constitutes the majority of the funds. Our sponsor levels are noted in the section that follows:
2. Team member registration fee, travel expenses (transportation, hotel, and meals), t-shirt costs, field trip expenses, and miscellaneous costs are all funded by the team member. The typical cost per student is \$500 to \$1,200 depending on the student's travel. Scholarships are available. Please see Faculty Advisor.

Team 1816 deeply thanks its Corporate Sponsors for their ongoing support of our participation in the *FIRST* Robotics Competition. Every year, our team must solicit corporate sponsorships and donations to support a \$35,000 budget to design and build a competition-ready robot. This budget does not include travel expenses to up to two regional competitions and/or the Championship event in St. Louis, MO. Listed here are a few of the budget line items:*

<i>FIRST</i> registration (entitles team to robot kit-of-parts and one competition)	\$5,000
Each additional regional event attended registration fee	\$4,000
Championship competition registration fee (if qualified)	\$5,000
Practice Playing field construction, practice robot	\$5,000
Robot construction	*+/- \$9,000
Computer hardware, software	\$1,000
Team promotional items (banners, robot signage, giveaways, mascot, team spirit, fliers, etc.)	\$4,000
Administrative costs (video, website fees, photocopies, postage, printing, etc.)	\$2,000
Outreach events (<i>FIRST</i> LEGO League, Jr <i>FIRST</i> LEGO League support; trailer & hitch; presentation materials)	\$5,000
Total:	*\$40,000

*This estimate includes two regional competitions and one Championship competition. It does not include travel costs for students, mentors, chaperones. All competitions require travel.

*+/- Robot construction costs vary from season to season.

SPONSORSHIP LEVELS

Level	Amount
Platinum Sponsor	\$10,000 and up
Gold Sponsor	\$5,000-\$9,999
Silver Sponsor	\$2,500-\$4,999
Bronze Sponsor	\$1,000-\$2,499
Contributor	\$500 - \$999
Green Machine Booster	To \$499

SAFETY

1. Team members will act in a safe manner AT ALL TIMES. This includes all team-related activities including while traveling to team events and during competitions.
2. Team members will be respectful of the Safety Captain(s) and adhere to any reasonable requests made by the Safety Captain(s) and team mentors.
3. Team members are required to attend an annual safety seminar and pass a Safety Quiz. Power tools or equipment may only be used under the supervision of an adult mentor.
4. Team members are required to wear safety glasses at work sites and in the pit area at all competitions. Team members are required to wear closed-heel and toe shoes (no Crocs or sandals) in work areas and at competitions. In addition, team members may be asked to wear gloves, face masks, and ear protection during certain tasks.
5. Horseplay will not be tolerated at any time.
6. All work areas will be cleaned up at the end of every day including sweeping the floors and work surfaces, putting away tools and materials, and throwing away trash.
7. Students will not socialize or linger in the workshop, Commons, Room 220, or other meeting spaces once the designated task(s) are completed.
8. Team members will not directly or indirectly give out personal information about themselves or other team members, either in person nor while using any form of team – related online/Internet communications/ digital media. This includes all social media (Twitter, Facebook, et al) associated with Team 1816, other FIRST teams or other FIRST-sponsored Forums, wikis or any Internet/Web/mobile device (smartphones, cellphones) communications. Students should be aware they are representatives of Team 1816 and that their actions and posts can reflect on the Team. We expect students' communications to be positive and should not negatively reflect on the team and should at all times reflect the tenets of FIRST and "Gracious Professionalism."

SEASON CALENDAR

September, 2015	<i>FIRST releases its calendar of events and other competition information.</i> <i>Team organization begins.</i>
October – December, 2015	<i>Weekly team meetings will be held in Room 220, Edina High School. Subteam meetings, outreach, mentoring, presentations, and/or other group sessions are scheduled as needed. The web calendar, email meeting notices and Facebook are regularly updated.</i> <i>Special events include Minnesota Splash, training sessions, field trip(s), STEM Career Night, Team Retreat, guest speakers, Homecoming parade.</i>
January 9, 2016	<i>FIRST Kick-off</i>
January 9 - February 23, 2016	<i>The 2016 Build Season</i> <i>Work sessions and meetings daily.</i>
February - April, 2016	<i>FIRST Regional competitions</i> <i>Lake Superior Regional: March 3 – 5, 2016</i> <i>Iowa Regional*: March 24 – 26, 2016. If team cannot register for this event, the team will try to register for the North Star Regional, April 7 – 9, 2016.</i> <i>None of these events overlap EHS's Spring Break. Students will need to make arrangements with teachers regarding missed assignments, homework, and tests.</i>
April 27 – May 1, 2016	<i>FIRST Championship, Edward Jones Dome, St. Louis, MO*</i>
May 2016	<i>Minnesota State High School League Championships, Williams Arena, U of MN – if team qualifies.* May 21, 2016</i> <i>Sponsor recognition, school recognition and post-season team celebration</i>
June - August, 2016	<i>Summer activities include training, community outreach, and corporate fundraising.</i>

*Team registration for these competitions is possible.

TEAM TRAVEL

Travel

Students are expected to attend at least one *FIRST* Regional event – in its entirety – each season. Students are strongly encouraged to travel to all events and competitions, including the Championship Event. All transportation, hotel and meal expenses are paid by each student and adult traveling with the team. Travel itinerary and information will be provided.

Expectations of student while traveling

Be a member in good standing (see Member Requirements).

Pay for their transportation, and hotel (in advance), and meals while there. (Scholarships are available).

Arrange ahead of time with their teachers to make-up any work missed (students may miss Wednesday, Thursday and Friday of school for competitions).

Complete all necessary paperwork for travel (permission slips, *FIRST* consent form, medical and health liability release, student behavior expectation form, etc).

Attend mandatory travel meeting(s).

Abide by all rules of conduct for traveling with the team (to be distributed prior to traveling).

Exhibit team spirit and “Gracious Professionalism” at all times while traveling.

PHOTOGRAPHY AND COPYRIGHT CONSENT

All team members are required to sign a Photography and Copyright Consent Form as part of your commitment to Edina Robotics *FIRST* Team 1816. This form gives the team your permission to use your image in photos, videos, etc., of the team that may be posted on the website or used in various other media such as printed brochures or the like. It's important for team publicity that we can display pictures of team members enjoying themselves at Team 1816 activities and events. We are careful to protect the identity of student. We only identify students in photographs or videos on the team's website by their first name and first letter of their last name.

The copyright portion of the consent form may sound complicated, but we use it so that anything you produce for Team 1816 that is copyrightable can be used by the team even after you graduate from Edina High School. For example, if you write a blog or newsletter that appears on the website, upload photos to the website, create a t-shirt design, write a computer program design for the team, or do anything creative like that, you are giving us permission to use these "works of authorship." There are some legal sounding words at the end of the paragraph: "royalty free" means that we're not paying you for the use of the work, it's part of your input to the team effort; "irrevocable" means that you can't come back at a later date or time and say we can't use your work (that wouldn't be fair to the team if we printed up a set of t-shirts using a design you'd given us and then you took back the permission to use it); "perpetual" means that the permission lasts as long as you own the copyright in the work; and "non-exclusive" means that you can let other people use or display the work (just because you let us use it doesn't mean to say others can't enjoy the benefits of your work). For example, you wrote a piece about robots that is uploaded to the Team 1816 website. Under this agreement, we could keep it there for as long as we wanted, but you would still be able to use it in other places. You might be able to get it published in a magazine or submit it as part of a scholarship application.

COMMUNICATIONS AND RESOURCES

Communications expectations:

All team members and mentors are required to have an email address and check it daily. As outlined by the *FIRST* STIMs, this address (preferably Google's Gmail) must be a personal one that is separate from school/corporate emails (**no school emails are accepted**). This also means no parent/family emails/shared email address can be used. This guarantees student access to the Green Machine mailing list, which is used exclusively for team business. On a side note, please use an appropriately named email address. The team website, including social media, the blog, calendar, texts, and missed calls should be checked frequently. Please make sure your phone is charged and that you try to conserve battery life (especially at competitions).

Any distributed roster of the team members, parents, and mentors is designated as for *team use only*. Team Distribution lists (students, parents, mentors) are designated *for team use only*.

General Team contact: contact@edinarobotics.com

Resources:

Edina Robotics: edinarobotics.com = Team website, news, calendar.

Facebook: The team maintains a public page accessible through our homepage or <https://www.facebook.com/pages/Team-1816-The-Green-Machine/113912638660613>. You do not need to be a member of Facebook to view this page. This page will often post announcements, schedules, meetings, events.

Twitter: The team regularly posts updates and news via Twitter.
@FIRSTteam1816

YouTube: The team regularly posts videos on its YouTube channel, <https://www.youtube.com/user/1816EdinaRobotics>. It is also accessible via the Team's homepage.

Minnesota *FIRST* Regionals: mnfirst.org = official website of the *FIRST* Minnesota Regional Competitions includes information about upcoming events and information about *FIRST* programs locally.

US *FIRST*: www.usfirst.org = official website of the *FIRST* Robotics Competition (FRC), includes sections devoted to the competition schedule, competition manual and resources, STIMs (for student registration) and other pertinent information.

Chief Delphi: <http://www.chiefdelphi.com/forums/portal.php> = a website of a veteran team with helpful information and forums on many topics.

www.thebluealliance.com = a website that archives videos of previous years' competitions and source of much helpful information.

www.theredalliance.com/ = a website that collects live feeds, offers scouting and other resources

www.firstnemo.org = a website with information for non-engineering mentors.

FIRST AWARDS

At all Regional and Championship competitions, *FIRST* recognizes “FRC teams for excellence in design, creativity, innovation, culture changing behavior and competition performance.” Since its founding in Fall 2005, Team 1816 has earned the following *FIRST* Awards:

2006

Winner, 2006 Wisconsin Regional Competition, March 2006, Milwaukee, WI
Highest Rookie Seed Award, 2006 *FIRST* Robotics World Championship, Atlanta, GA

2007

Daimler Chrysler Team Spirit Award, 2007 Wisconsin Regional, Milwaukee, WI
Newton Division Finalist, 2007 *FIRST* Robotics World Championship, Atlanta GA
Silver Award, 2007 National Fuel Cell Game Design Challenge, "Lazer Maze Craze"

2008

Regional Chairman's Award, March 2008 Minnesota Regional, Minneapolis, MN

2009

Winner, Best Website, 2009 Wisconsin Regional
Finalist, 2009 Minnesota North Star Regional
Winner, Best Website, 2009 Minnesota North Star Regional
Winner, Autodesk Visualization Award, 2009 Minnesota North Star Regional
Winner, Website Excellence Award, 2009 *FIRST* Championships, Atlanta, GA
Mark Lawrence, Woodie Flowers Award Winner, 2009 Minnesota North Star Regional

2010

Winner, Johnson & Johnson Gracious Professionalism Award, 2010 Minnesota North Star Regional
Winner, Best Website, 2010 Minnesota North Star Regional
Laurie Shimizu, Outstanding Volunteer, 2010 Minnesota North Star Regional

2011

Winner, Engineering Inspiration Award, 2011 Lake Superior Regional
Semifinalist, 2011 Lake Superior Regional
Winner, Best Website, 2011 Lake Superior Regional
Winner, Industrial Safety Award - Underwriters' Laboratories, 2011 Lake Superior Regional
Emily Condiff, Safety Star of the Day, 2011 Lake Superior Regional
Emily Benson, Dean's List Finalist, 2011 Lake Superior Regional
Semifinalist, 2011 Minnesota North Star Regional
Winner, Best Website, 2011 Minnesota North Star Regional
Winner, Website Excellence, 2011 Lake Superior & North Star Regionals
Galileo Division Participant, 2011 *FIRST* Championships, St. Louis, MO

2012

Semifinalist, 2012 Lake Superior Regional
Winner, Entrepreneurship Award presented by Kleiner Perkins Caufield Byers, Lake Superior Regional
Winner, Best Website, 2012 Lake Superior Regional
Regional Chairman's Award, Minnesota North Star Regional
Finalist, 2012 Minnesota North Star Regional
Winner, Best Website, 2012 Minnesota North Star Regional
Winner, Website Excellence, 2012 Lake Superior & North Star Regionals
Winner, Entrepreneurship Award, 2012 North Star Regional



Archimedes Division Participant, 2012 *FIRST* Championships, St. Louis, MO
Semifinalist, *FIRST* Minnesota State High School League Robotics Championship, Minneapolis

2013

Innovations in Control Award, 2013 Lake Superior Regional
Quarterfinalist, 2013 Lake Superior Regional
Rachel Earl, Safety Star of the Day, 2013 Lake Superior Regional
Winner, Regional Engineering Inspiration Award, 2013 Minnesota North Star Regional
Entrepreneurship Award presented by Kleiner, Perkins Caufield Byers, Minnesota North Star Regional
Winner, Industrial Safety Award - Underwriters' Laboratories, 2013 North Star Regional
Karl Otness, Safety Star of the Day, 2013 North Star Regional
Quarterfinalist, 2013 Minnesota North Star Regional
Curie Division Participant, 2013 *FIRST* Championships, St. Louis, MO
Honorable Mention, Comcast Media and Technology Award
Qualifying Team (ranked 16th), *FIRST* Minnesota State High School League Robotics Championship, Minneapolis

2014

Winner, Regional Chairman's Award, 2014 Lake Superior Regional
Quarterfinalist, 2014 Lake Superior Regional
Underwriters' Laboratories Safety Award, Honorable Mention
Finalist, 2014 North Star Regional
Johnson & Johnson Gracious Professionalism Award, 2014 North Star Regional
Underwriters' Laboratories Safety Award, Honorable Mention, 2014 North Star Regional
Yoji Shimizu, Outstanding Volunteer, 2014 North Star Regional
Archimedes Division Participant, ranked 35th, 2014 *FIRST* Championships, St. Louis, MO
3rd Place Winner, *FIRST* Minnesota State High School League Robotics Championship, Minneapolis

2015

Quarterfinalist, 2015 Lake Superior Regional
Winner, Regional Engineering Inspiration Award, Lake Superior Regional
Winner, Regional Chairman's Award, 2015 Minnesota 10,000 Lakes Regional
Quarterfinalist, 2015 10,000 Lakes Regional
Entrepreneurship Award Entrepreneurship Award presented by Kleiner, Perkins Caufield Byers, 2015 Minnesota 10,000 Lakes Regional
Underwriters' Laboratories "Hard Hat" Safety Award Honorable Mention, 2015 Minnesota 10,000 Lakes Regional
Curie Subdivision Quarterfinalist, 2015 *FIRST* Championships, St. Louis, MO
FIRST Trailblazer Award – for helping make *FIRST* a Varsity Sport in Minnesota
Mark Lawrence, National Woodie Flowers Award Winner, 2015 *FIRST* Championships, St. Louis, MO.
4th Place Winner, *FIRST* Minnesota State High School League Robotics Championship, Minneapolis

TEAM 1816 AWARDS

In the spirit of *FIRST*, Edina Robotics in 2008 established team-only awards to recognize team members who demonstrate extraordinary commitment and contributions, as well as excellence in creativity, innovation and competition performance. All of these award winners superseded what was expected of them in their role on the team. The awards are made at the discretion of the Team's faculty advisor in consultation with Team mentors. *As such, not every award is made every year.*

Christopher Miller Leadership Award: Our team's highest honor, named for Christopher Miller, the Edina junior who founded Team 1816 at Edina High School in 2005. This award is presented to the student who demonstrates outstanding leadership skills, a high-level of responsibility and commitment, and the ability to inspire others to become involved with science, technology, engineering and math via *FIRST* Robotics.

2008: Andrew Peter

2009: Daniel Purdy

2010: Emily Benson

2011: Emily Benson

2013: Alexander O'Neill

2015: Peter Hartnett

Distinguished Service Award: To a student who goes above and beyond what is expected of a Team 1816 member. This student takes on leadership, seeks opportunities, encourages team members to learn things outside their first area of interest, mentors team members, exhibits grace while in stressful situations, and dedicates an extraordinary amount of time to the team with a strong passion for all things robotics.

2008: David Cook

2009: Matt Hornung

2012: Alexander O'Neill

2013: Rachel Earl, Rebecca Earl

2014: Erika Ding

2015: Peter Otness, Erika Ding

Distinguished Achievement Award: Presented to the Team 1816 member who has achieved a high level of aptitude in one or more areas and has made significant contributions in those areas.

2009: Gregory Budd

2010: Anna Waldo

2011: Emily Condiff

2012: Peter Jacobson

2013: Ken Shimizu

2015: Jordan Schenck

Excellence in Engineering: Presented to the student who not only exhibits strong technical skills but also demonstrates motivation, flexibility, and dexterity by learning about engineering systems and processes. The student receiving this award demonstrates strong creativity and inventiveness in engineering design.

2008: Ross Neal

2009: Matthew Hornung

2011: Sam KenKnight, Kevin Kruempelstaedter, Alex Pastor

2012: Alex Pastor

2013: Matthew Balafas & John Norris

2014: Evan Pastor

2015: Erin Balestri

Engineering Inspiration: Presented to the student who shares their enthusiasm for science, technology, engineering and math with the team, the *FIRST* community, and the community at large.

2011: Michael Woolsey
2012: Danny Gratzner
2013: Seth LiaBraaten
2014: Matthew Balafas
2015: Evan Pastor

Gracious Professionalism Award: This award celebrates outstanding sportsmanship and gracious professionalism both on and off the competition field.

2009: Anna Waldo
2010: Dan Purdy
2011: David Fogg, Monica Gates, Alex O'Neill, Connor Syring, Ngoc Tran
2012: Joe Sidy
2013: Karl Otness
2014: Joe Sidy
2015: Nate Carlin

Volunteer Award: Presented to a Team 1816 member (including mentors and adult volunteers) who has given generously of their time, energy, resources and talents in support of the mission and values of *FIRST*.

2008: Evan Shimizu
2009: Evan Shimizu
2010: Andrew Peter, Evan Shimizu
2012: Dr. Iain McIntyre (mentor)
2013: David McGoff (mentor); Kevin Kruempelstaedter
2014: Seth LiaBraaten; Kris Pastor (FLL Coordinator)
2015: Amy Ma; Karin Wentz & Mark Otness (adult volunteers)

Creativity Award: Celebrates creativity and design by a student, who demonstrates development of innovative skills and the blending of art and science.

2009: Ross Petersen
2010: Clara Lee
2011: Clara Lee
2012: Andrew Smith
2015: Graham Balfany

Judges' Award: During the course of the season, the mentors may decide a student's unique efforts or performance merits recognition.

2009: Alistair McIntyre
2010: Emily Condiff
2011: Ben Liu, Kirsten McIntyre, Ken Shimizu
2012: Ken Shimizu, Kate Elmer
2013: William Weyrens, Kyle Condiff
2014: Srujun Gupta
2015: Phoebe Sanders, Owen Stidman, Jack Ellingson

Rookie All-Star: To a student who learns as many different aspects of the team as possible, demonstrating dedication, motivation and responsibility.

2010: David Fogg
2011: Alexander O'Neill
2012: Rebecca Earl, Rachel Earl
2013: Srujun Gupta
2015: Allison Schwoboda

Rookie Achievement: To a student who excels in a specific aspect of the team.

2010: Joel Morton

2011: Andrew Smith

2012: John Norris

2013: Peter Hartnett, Evan Pastor

2014: Erin Balestri

2015: Neeshan Khanikar

Rookie Inspiration: To a student who demonstrates enthusiasm, commitment, and the willingness to give everything a try.

2008: Remington Goodenough, Amy Zhang

2009: Terry Guan, Emily Benson

2010: Michael Woolsey

2011: Monica Gates

2012: Lauren Woolwine

2013: Tommy Densinger

2014: Declan Doperalski

2015: Trent Fox

TEAM 1816 HISTORY

2006 Season - Our Rookie Year: Highest Rookie Seed Award at Worlds

In Fall 2005, Edina High School junior Chris Miller, with a group of friends, formed a robotics team for the purpose of competing in the *FIRST* Robotics competitions. Chris, who was team captain, applied for and received a \$6,000 seed grant from NASA, allowing the team to attend the kickoff in Milwaukee, WI in January 2006 for the competition game “Aim High.” The team was assigned the *FIRST* number 1816, and adopted the nickname “*The Green Machine*.”

During our 2006 rookie season, 14 EHS and Valley View Middle School students collaborated to design, build, and field a 5-foot tall robot. The team built the robot in the newly remodeled kitchen in the home of Chris Miller’s father. The team’s major sponsors in 2006 were NASA, Medtronic, Inc., and Edina Education Fund. 1816 had an outstanding rookie season, winning the Wisconsin Regional Competition with its alliance partners Team 111-Wildstang and Team 1625-Winovation. At the Championship competition in Atlanta, the team finished as the 6th seed out of 85 teams in Archimedes Division, earning the “Highest Rookie Seed Award.”

2007 Season– Growth: Team Doubles in Size; Recruits and Mentors 7 New Minnesota Teams; Governor’s STEM Summit

In 2007, the Team more than doubled in size to 35 students. Using warehouse space donated by Honeywell Inc., the team built a robot to compete in the game “Rack ‘n Roll.” The Green Machine recruited and mentored seven new Minnesota teams via the first-ever MN Governor’s STEM Summit, and helped host the first-ever Minnesota Kickoff at the University of Minnesota, which included Friday night seminars ahead of the Kickoff event. The Green Machine was selected to beta-test robots using hydrogen fuel cells. This earned the Team a spot at Championships, where the Team won second-place for game design in the *FIRST* Fuel Cell competition. The Team’s alliance also finished as Newton Division Finalists at the World Championships. The team moved out of the warehouse space and into Edina High School proper, sharing space with the EHS Thespians.

2008 Season – Outreach: Development of Minnesota SPLASH; President’s Circle Finalist; Winner of Minnesota Regional Chairman’s Award

The Green Machine focused on Outreach in 2008, including the extension of Friday night Kickoff seminars into development of Minnesota SPLASH, a first-ever all day pre-season event designed to help new and returning teams prepare for the competition season. Other outreach efforts during the year included participation in the inaugural *FIRST* President’s Circle, mentoring two *FIRST* Lego League teams, and advising *FIRST* teams locally and worldwide through the Team’s new Web forum, videos and email. These outreach efforts were recognized when The Green Machine won the regional Chairman’s Award at the inaugural *FIRST* Minnesota Regional, earning the Team a trip to World Championships and a slot in the Galileo Division. The team wrapped up 2008 by earning the title of “Minnesota State Fair Robotics Competition Champion” in September.

2009 Season - Building the *FIRST* Pipeline: Team 1816 Launches Edina’s first-ever FTC Team; Mentor Recognition: Woodie Flowers Award presented to Team 1816 Founding Mentor Mark Lawrence

In September 2008, The Green Machine helped launch Edina’s first-ever *FIRST* Tech Challenge (FTC) team, Team 2887 – The Bucket Brigade. Many of The Bucket Brigade’s members, students in grades 7 – 9 at Edina Valley View Middle School, would in later years become integral members of The Green Machine. Another highlight of the 2009 season was the Team’s selection as one of 18 beta test teams in the nation to test a new robot control system. The Green Machine collaborated with two other veteran Minnesota *FIRST* teams on six weeks of testing, and

then presented seminars to other teams on the new technology, including seminars at Minnesota Splash, which in the 2009 Season attracted 500 to 600 participants. In competition, The Green Machine finished in fourth place in qualification rounds at the Minnesota North Star Regional, reaching the finals, but losing in the final match. Best Website awards at two regionals, and a first-ever Autodesk Visualization Award for the team's "Green Power" animation, were evidence of the Team's strong presence in non-build areas. Team 1816 also took pride in the well-deserved recognition of one of the Team's founding mentors: at the North Star Regional, Mark Lawrence, a Team 1816 founding mentor and Director of Technical Operations, won the Woodie Flowers Award. The award, named after the *FIRST* cofounder and MIT professor emeritus, celebrates mentors who "lead, inspire, and empower using excellent communication skills."

2010 Season – Gracious Professionalism: Team awarded the Johnson & Johnson Gracious Professionalism Award at North Star Regional

In addition to the Team's typical full season of outreach events, which begin long before kick-off, the Team added to its "green" theme by volunteering at ecology-centered events, and weekly "green" tips became a popular feature on the Team's website. In September 2009, the Team was again selected by *FIRST* as a beta testing team for the 2010 season. At the North Star Regional, Team 1816's enthusiasm, attitude and service off the field were recognized with the Best Website Award for the second year in a row, and with the Johnson & Johnson Gracious Professionalism Award for the Team's outstanding support of other teams. The season was capped with another trip to Championships in Atlanta.

2011 Season – Engineering Inspiration: Team awarded the Lake Superior Regional Engineering Inspiration Award

Outreach and community activities filled out the summer 2010 calendar for Team 1816, with the highlight of summer 2010 a gathering of The Green Machine and 15 other Minnesota FRC teams at the Minnesota State Fair for ten days of FRC-game style competition. Recruiting then became the Team's focus, with one of the Team's largest recruiting efforts to date resulting in many new members, including those ready to graduate from Edina's *FIRST* Tech Challenge teams. Team 1816 was again one of the 59 *FIRST* Robotics teams selected to beta test new robot software. With other Minnesota beta testing teams, Team 1816 presented its findings during the annual Minnesota SPLASH day of training seminars hosted by The Green Machine. In 2011, Team 1816 attended the new Lake Superior Regional in Duluth, MN. More than 40 teams turned out for this new regional, which proved to be a very successful event for 1816: The Green Machine made it to semifinals, and the Team won many additional awards: the UL Safety Award, the Best Website Award, and the Regional Engineering Inspiration Award. The Engineering Inspiration Award gave the Green Machine the opportunity to attend the Championship Competition in St. Louis, MO, and included a NASA grant of \$3000. In addition, Team captain Emily Benson was named a Dean's List Finalist.

2012 Season – Varsity Robotics: *FIRST* Robotics Recognized by the Minnesota State High School League as a Varsity Sport; Regional Chairman's Award

It was with great pride that Team 1816 stood with Minnesota Senator Al Franken at the Minnesota State Fair as the announcement was made that *FIRST* Robotics in Minnesota is now an endorsed activity of the Minnesota State High School League, complete with a State Championship. The Green Machine's mentors and Team captain were again in the spotlight on KARE 11 TV in September, part of an hour-long TV special on how mentoring students can make a huge difference in the world. At the March 2012 Lake Superior Regional, the Team made it through semifinals and won awards for Entrepreneurship (the Team's business plan) and Best Website. At the North Star Regional, the Team made it all the way to finals. While The Green Machine didn't win the finals, the Team did win awards for Entrepreneurship and Best Website, as well as the pinnacle of *FIRST* awards, the Regional Chairman's Award, which sent Team 1816 (again) to compete at Championships in St. Louis. During Championships, the Team learned that The Green Machine qualified for the first -ever Minnesota State High School League Robotics

State Championship. At the state championship, The Green Machine made it through the semi-final rounds.

2013 Season – Publicizing the Values of *FIRST*: “be *FIRST*®” Campaign Inaugurated; Front-page Publicity for *FIRST* Robotics in Minnesota

In 2013, The Green Machine introduced its “be *FIRST*” campaign at the Lake Superior Regional: to be gracious, to be innovative, and to be and act your very best at all times. Also in Season 2013, The Green Machine was featured in a front-page article on robotics in the Minneapolis Star Tribune (circulation of over 500,000). The story highlighted Minnesota as the first state to recognize *FIRST* Robotics as a varsity sport, noting that, even in the “State of Hockey,” there are more *FIRST* robotics teams in Minnesota than varsity hockey teams! Team 1816 had its usual full calendar of community outreach and peer-to-peer mentoring events during the year, including joining with Team 2239 – Technocrats, Hopkins, to help them through their first-ever outreach event. At Lake Superior Regional, Team 1816 won its first-ever robot-specific award, the Innovation in Control Award, for creative auger design and use of vision tracking. At the North Star Regional, Team 1816 helped a rookie FRC team from Mexico, Team 4667-Synergy, make the most of their regional competition: The Green Machine accepted shipment of their robot, then took it to the 10,000 Lakes Regional along with an 1816-built pit (tools included). At North Star Regionals, The Green Machine won the Regional Engineering Inspiration award, which gave the Team a slot at Championships. Team 1816 brought its “be *FIRST*” campaign to Championships, and selected FRC Team 16, Bomb Squad, as its national winner. *FIRST* award presenter Comcast singled out The Green Machine for an honorable mention (top 7 in the entire world) for the Team’s Digital Media campaign, covering the Team’s website and social media presence. After Championships, 1816 participated in the second-annual Minnesota State High School League Robotics Competition.

2014 Season - Chairman’s Award at Lake Superior Regional Earns *The Green Machine*’s trip to Nationals; Captain of Finalist Alliance at the North Star Regional; STEM Career Showcase; Workshop Visit from U.S. Senator Al Franken

The Green Machine’s exciting and event-filled 2014 season began with a full schedule of pre-season activities, including a team-run popular Legos NXT Camp for younger students in the summer, presentations on *FIRST* robotics to sponsors DOW Water Solutions and Stratasys, workshops on safety and programming at Minne-Mini Regional, and the team-sponsored *FIRST* Day in Edina (successor event to SPARK Day), with a workshop open house and robot demonstrations that included Edina FTC and FLL teams. Team 1816 also helped run the first-ever FTC qualifying tournament held in Edina, and (that same day!) assisted with Robot Day at the Minnesota Children’s Museum. During pre-season, the team also organized its first-ever STEM Career Showcase, highlighting the STEM careers of team mentors. *The Green Machine* was also proud to host a pre-season visit to its workshop by U.S. Senator Al Franken. When competition season began, *The Green Machine* was ready! At the Lake Superior Regional in Duluth, Team 1816 was thrilled to win the prestigious Chairman’s Award, earning a place at Championships in St. Louis. This year’s robot, Zeke, also performed well at the North Star Regional at the University of Minnesota, where Team 1816 captained the finalist alliance and received the Gracious Professionalism Award. Team 1816 continued its Be *FIRST* peer to peer campaign awarding teams 3313, 27, 2502, 3130, 2016, and 1736 with the 2014 “be *FIRST*” award. *The Green Machine* reached 35th place in the Archimedes Division at Championships, as Zeke and the drive team pushed hard in every match. After Championships, 1816 participated in the third-annual Minnesota State High School League Robotics Competition, coming away with the competition’s first-ever third place award!

2015 Season – Growth

We launched our 2015 season (and 10th anniversary year!) with an early-summer trip to Washington, D.C. This was the second year Team 1816 participated in the STEM/*FIRST*

Robotics National Advocacy Conference, hosted by *FIRST* Team 27-RUSH, during which representatives of the Team advocated for STEM education on Capitol Hill in meetings with Minnesota's two senators and four of the state's representatives. A busy summer of robotics camps for elementary and middle school students followed. In the fall, the Team presented workshops on safety and programming at the Minne-Mini Regional, and also hosted Robot Day at the Minnesota Children's Museum. Two major highlights of the fall pre-season were the Team's second annual STEM Career Night, spotlighting the STEM careers of Team mentors and other STEM professionals, and the first-ever Team Retreat, an overnight at a local hotel in which Team bonding (fitness) and Team history (describe 1816 in one word) were key components. In December the Team helped organize and run several aspects of *FIRST* Robotics Day in Edina, a day that featured Junior *FIRST* LEGO League, *FIRST* LEGO League and *FIRST* Tech Challenge tournaments. At the Team's request, the Mayor of Edina officially proclaimed this day Robotics Day in Edina. As Team 1816 headed into competition season, it boasted a roster of 52 team members, a significant increase in membership from the prior season.

At the Lake Superior Regional, Duluth, in February, 1816 was seeded fifth going into quarterfinals. Although the Team was eliminated in quarterfinals, the Team's promotion of STEM education and support of other teams was recognized with the Regional Engineering Inspiration Award. Winning the Engineering Inspiration Award entitled the team to attend Championships in St. Louis in April, and also carried with it a \$5,000 grant from NASA to cover Championship registration expenses. At the 10,000 Lakes Regional in Minneapolis in early April, the team led tours to several valued sponsors, and assisted several teams from China who were attending their first-ever *FIRST* regional competition. Mandarin-speaking team members and parents translated for these teams throughout the competition. At the end of the pre-qualification rounds the team was seeded 10th, and was picked by the third-seeded alliance to join them in the elimination rounds. Although the Green Machine was eliminated in quarterfinals, the team came away from the competition with several awards: the Entrepreneurship Award, in recognition of the team's business plan and fiscal sustainability, and the regional Chairman's Award, in recognition of the team's overall success in embodying the values of *FIRST*. Receiving the Chairman's Award meant that the team would represent Minnesota in competing for the National Chairman's Award at the *FIRST* Championships in St. Louis. At Championships, the Green Machine joined over 600 *FIRST* Robotics, FTC, FLL and Jr. FLL teams from 40 countries for an exciting several days in St. Louis. The Green Machine competed on Curie field, and at the end of the qualifying rounds was thrilled to be chosen by the fifth-ranked team as their first alliance partner. Unfortunately the Green Machine's alliance was eliminated in quarterfinals. A highlight for the team at Championships was the recognition of 1816's valued mentor, Mark Lawrence, with the national Woodie Flowers award. This award recognizes an outstanding engineer or teacher who best demonstrates teaching excellence in teaching science, math and creative design. Also at Championships, team mentor Laurie Shimizu (with Mr. Lawrence) presented at a conference session held to brief teams on "How to Make *FIRST* a Lettered Sport in Your State." Competition season concluded with the Minnesota State High School League State Tournament at Williams Arena at the University of Minnesota on May 16. The state's top 30 teams (out of 192) qualified for the event at *FIRST* regional competitions during March and April. At the tournament, we were pleased and honored to be chosen as an alliance partner by the 4th place alliance. Narrowly missing finals, our alliance ended the tournament in 4th place. At State, we enjoyed hosting a group of children from Simpson Housing Services: It's always fun to talk robotics with kids! Another great year came to an end with the State Tournament, but we were already looking forward to our summer 2015 D.C. advocacy trip and LEGO™ camps.