



## 2013 Oakland County Competitive Robotics Association Notre Dame Preparatory School - Team 33 Foundation Award

### Team Overview

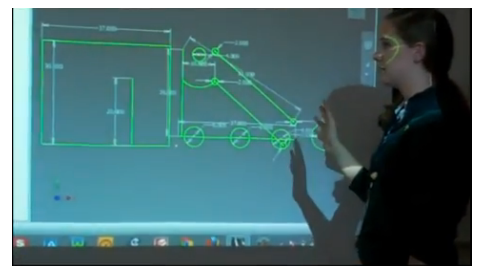
For 19 years, Team 33, the Killer Bees have been participating in Competitive Robotics in Oakland County. Since the beginning of OCCRA, our team has been entirely student managed and executed, doing everything from planning meeting agendas to designing and fabricating a functional robot. With 40 members during the FIRST Robotics season, our OCCRA season is not mandatory, which allows students to pursue other interests in the fall while still maintaining the same amount passion and devotion to learning that has become a Killer Bee standard. We feel that by making OCCRA optional, every team member can achieve a balance in their extracurricular activities. This way, every member has an opportunity to create a tangible impact on the success of the team and hone their skills.

### Workplace

This season, we aimed to coordinate with teachers and administration to create a safe workplace. While a classroom seems insignificant, it is a vast improvement from past years when our robot was built in school hallways. This year, student leaders coordinated with administrators to dedicate a single classroom in which students could work on OCCRA and VEX robots under adult supervision. During meetings, an ordinary math classroom turns into a shop with desks pushed together as workbenches, one side of the room dedicated to power tools, and separate sections of the room for various sub-teams to work. At the end of every meeting, metal shavings are swept up, desks restored to their original position, and team resources stored neatly in the corner. Even though it seems simple, this daily routine teaches students about workplace etiquette and safety when sharing a space. Outside of the classroom, the robot, band saw, and other assorted storage boxes and tools make their way around Oakland County from competitions, school, and to our student team leader's garage every weekend so we can repair and optimize it for the next competition. Workspace seems like a small obstacle or achievement, but we are truly proud of how this year's team has risen to the challenge.

### Design Process and Team Structure

Our team is structured so that cooperation begins with the integration of upperclassmen and underclassmen, allowing us to have a coherent approach to creating a robot in an efficient manner while teaching new students. Upperclassmen provide knowledge and experience while underclassmen bring a new perspective and a passion for learning; therefore, the two groups naturally cooperate very well. We began the season with deciding what major goals we would like the robot to accomplish, and brainstormed design ideas. From there, a more experienced team of upperclassmen worked





together to design the robot in CAD using Autodesk Inventor. While this was going on, less experienced members were shown the basics of using tools and were also able to apply their knowledge by taking apart the robot from the previous year. After that, we begin fabricating the robot in various sub-teams: collector, lift, chassis, electrical, and shooter. However, no member is completely defined or limited by their job; for example, a member can help to build the shooter one day or help design the team website the next. Due to our relatively relaxed team structure, we are able to easily cooperate and overcome problems without much difficulty.

### Mentor Involvement

During the OCCRA season, our mentors don't have very much to do while the students run the team. However, our lead mentor, Jim Zondag, acts as a referee, builds the field, and serves on the game design committee. In addition, Julia Green is acting as the lead querier for all OCCRA events and Jason Miller is also a referee. We love seeing them support us in new ways and appreciate how they make OCCRA possible. Finally, we also need to thank our faculty liaison, Susan McGinnis, for being our supervisor and always bringing us snacks.

### Community Outreach

Beginning last summer, the Killer Bees created an organization called the Purple Alliance, where we organize monthly service activities. The Purple Alliance is a group of teams who work together to promote STEM in our common communities and help those in need. For example, in August, members of Teams 33 and 68 (Brandon High School) went to a science camp for children living in poverty in Pontiac at the Baldwin Center to facilitate hands-on engineering activities. Kids had the chance to drive our robot, play with tools, and



experience problem solving outside of a classroom environment. In October, Teams 573 (Brother Rice/Marian) and 33 went to our local American House assisted living facility where we taught the residents how to use technology, explaining everything from iPads to Facebook. During the OCCRA diversity tournament, the Purple Alliance facilitated our November service event where Killer Bees and Notre Dame Prep's National Honor Society packaged over 1,275 meals. The unique design of the Purple Alliance allows teams to collaborate with others and learn how other teams operate

while serving our similar communities. In the same way, teams can participate in a competition while still promoting STEM and helping others. On November 2nd, the Killer Bees were able to "divide and conquer"- helping members of our school and local robotics communities find service opportunities, helping feed the hungry at our door, and assisting other teams during the Diversity Tournament.

### OCCRA Outreach

In addition to making a concentrated effort to positively affect our Oakland County



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community by giving back to various organizations throughout the year, we consistently provide tools, expertise, and students to help other OCCRA teams when in need. For example, while our OCCRA team is comprised of about 12 students, the Killer Bees were a huge help to many teams during the Diversity Tournament. With an evenly gender-balanced team, experienced ladies were around to lend a helping hand in the pits, coaching, driving, operating, and fixing robots for fellow teams. During the gender-specific portions of the competition, team members constructed the OCCRA VEX practice field, allowing other OCCRA high schools and middle schools to prepare for the upcoming competition. The following week at the OCCRA VEX Championship, Team 33 was one of the event partners, providing the VEX field and game elements. In addition, Killer Bees provided technical support to other teams to help them get their robots up and running.



### Safety

Safety is a priority on Team 33. Student team leaders enforce rules regarding hair and attire. Skirts and lanyards are not allowed to be worn, and safety glasses are required when operating machinery. When students are being taught about shop work and hand tools, they are taught the most safe and proper methods. We promote safety by having a count of our days without injury in all of our build spaces. Students are also always encouraged to ask questions and get help if they feel unsafe operating any equipment. Assuring the safety of every member is very important to the Killer Bees, and emphasizing safety on the team more prominently is one of our many goals for the upcoming year.

### OCCRA Awareness

The Killer Bees have risen to the challenge of promoting OCCRA to our school, parents, and community. We have worked with our administration to make the school more positively aware of robotics by displaying awards in hallways and at open houses. The Killer Bees communicate with parents by sending out the "Weekly Buzz," a weekly email containing all the important information and links for both parents and students. We also have students speaking to potential members and parents at both club exposition nights and open houses hosted by our school. At the beginning of the year, members talked to freshman science classes to impress upon them the importance of robotics, along with everyday application of engineering and technical skills. This process boosted our freshman involvement measurably, so it will be continued in future years. The Purple Alliance, another inaugural effort, will also continue.

Team 33 makes a concerted effort to positively represent the OCCRA organization, its sponsors, and our school in everything that we do. The Killer Bees are extremely grateful to



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the Oakland Schools Education Foundation which makes this organization possible each year and for the opportunity to apply our knowledge in engaging real-world applications.