



EXECUTIVE SUMMARY

Lake Monsters Robotics has grown in its commitment to sparking passion and creativity in our young engineers, giving them a head start toward a purposeful life and a satisfying future career.

TEAM MISSION STATEMENT

Building Awesome

The Lake Monsters Robotics team is building awesome in three ways:

1. **Building knowledge:** Offering real world experience to develop mechanical, electrical, programming, marketing, and business skills.
2. **Building people:** Inspiring innovators who work toward fulfilling their goals with a consciences effort to practice cooperation and sustainability.
3. **Building community:** Connecting with others outside of FIRST to bring robotics to the community.

Lake Monsters Robotics is a group of students and mentors who love what they do: creating technological works of art, fueled by the passion of creative engineers.

TEAM ORIGIN

Now in its eighth year, Lake Monsters Robotics was formed in 2008 by Matt Price and Sarah Alt-Price, both physics teachers at Lakeridge High School who coached the team through 2011. Since 2012, the Lake Monsters have been a volunteer- and student-led program. The team coach for the 2012 season was Mike Rode, a mechanical engineer from Hewlett Packard. The 2013-2014 season team coach was Stacey Lee, an engineering project manager at Veris Industries. The 2015 season team coach and faculty advisor is Dr. Owen Griffiths, a physics teacher at Lake Oswego High school and former application engineer at Tektronix.

Lake Monsters team membership has remained consistent with 15 to 20 students each season. A dedicated core group of six to nine engineers have enthusiastically mentored the team each season. For the 2015 season, the team has 23 members and 12 mentors, which is an increase over the 15 students from the 2014 season.

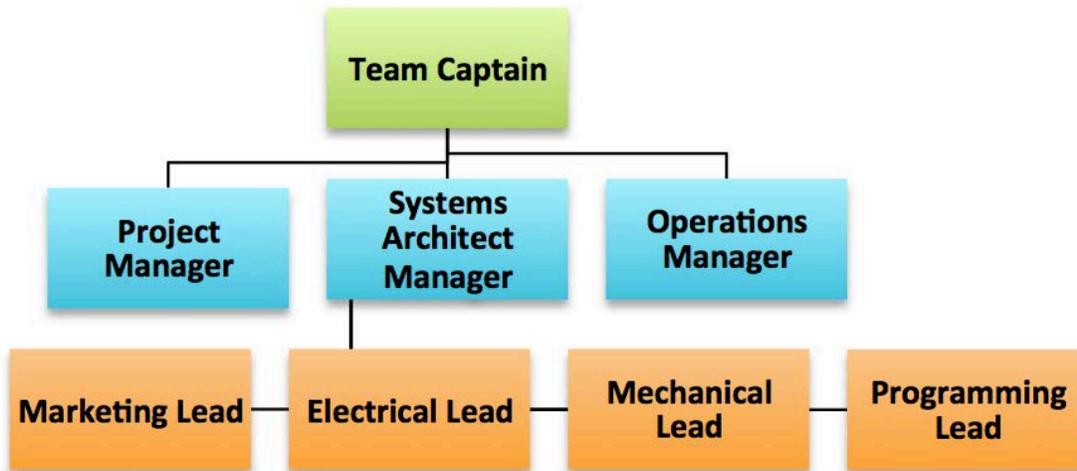
Since 2011, the Lake Monsters Robotics lab has been located in a dedicated shop room at Lakeridge High School. The team serves Lakeridge and Lake Oswego high schools, providing an opportunity for all high school students in the district to learn about engineering.

With state funding cuts, programs like shop have been eliminated from the Lake Oswego School District curriculum. Within two years, the Lake Monsters team increased interest in STEM programs. The school board now offers a class in Principles of Engineering and Intro to Engineering Design.

The team won the 2009 Oregon Regionals and a Judges award at the PNW district event at Oregon City High School.



ORGANIZATIONAL STRUCTURE



The student leadership structure is based on the fundamental need for open and efficient communication. The top leadership team, comprised of the Team Captain, Project Manager, Systems Architect Manager and Operations Manager, is chosen by the mentors at the beginning of the school year through an application process. The four subteam lead positions in marketing, electrical, mechanical and programming are filled based on commitment and work shown in previous years. Rookie students are encouraged to take on smaller leadership roles, including Safety Lead and Scouting Lead at competitions.

The Team Captain represents Team 2635 in all official capacities, including FIRST competitions. This student manages internal aspects of the team, including leading team meetings and driving the goals with action-based agendas for design and robot building.

The Systems Architect Manager is responsible for knowledge of overall robot design and game strategy. Working with all subteam leads, the student is responsible for approval of robot design decisions. Following FRC game rules and regulations, the student ensures that the robot meets all game requirements.

The Project Manager manages the robot build schedule, including tracking requirements, features, tasks, build schedule, assignments and the completion of the bill of materials. This student maintains the status data on each domain, working with the Team Captain to enforce the schedule and cohesion.

The Operations Manager manages marketing activities, including fundraising, sponsorships, recruitment, team swag and pit design.



RELATIONSHIPS

The Lake Monsters are grateful for the gracious support of team sponsors and community members. Special thank you cards, signed by all team members, are sent to team sponsors with a Lake Monsters T-shirt. Sponsors are invited to attend FRC competitions and share in the excitement of FIRST programs.

Team member recognition is a part of the Lake Monsters team culture. Student who demonstrate a strong work ethic are recognized with the ROBBY Quality Award and activities letter. Each week during the build season, one team member is selected to win the ROBBY Quality Award. To win the ROBBY, students must follow the three laws of FIRST robotics: Design first • Measure twice • Cut last. In addition, students who meet requirements for attendance at team meetings, FRC competitions and outreach activities may qualify for an activities certificate from the Lake Oswego Community School.

When the season is over, the Lake Monsters celebrate with the End of Season Awards. This evening dessert event features a slide show of the season, certificates honoring each student, thank you cards for mentors, and small gifts for seniors, mentors, and the faculty advisor. It's a celebration of the long hours, hard work and commitment each member and mentor gives to the team.

Education is important to the team. Students may earn transcript credit for participating on the Lake Monsters robotics team and demonstrating proficiency in selected engineering and marketing disciplines. A participant may receive 0.5 proficiency credit for one season, by meeting the breadth and depth requirements.

DEPLOYMENT OF RESOURCES

Through three primary areas of operation, Team 2635 spreads the message of FIRST, inspire others to get involved, and ensure that every team member reaches their full potential.

Outreach

- *Mentor FLL teams:* Two team members have mentored and volunteered with FLL teams.
- *Spark interest in STEM:* Demonstrate the robot in local schools and the community to teach both adults and children about STEM. The team has done presentations at Farmer's Market, the Oregon GEARS show, and the Lake Oswego Public Library.
- *Host annual computer drives:* Starting in 2014, the team successfully conducted its first computer drive, collecting more than 35 laptops to refurbish and donate to at-risk students at Rosemary Anderson High School, an alternative school in Portland. We plan to continue our efforts with an annual computer drive.

Engineering

- *Create sustainable robots:* The team reuses robot parts and repurposes other materials for use in robots.
- *Lake Monsters U:* To educate and improve engineering skills, team members have access to mentor-led classes, including mechanical skills, CAD and programming.

Operations

- *Raise funds from sponsors:* Team members presented at local companies to gain sponsorships, improving communication skills and increasing confidence.



- *Create a media platform:* Through the team website and social media, team members market the Lake Monsters brand to potential members and sponsors, and share teaching tools with avid engineers.
- *Develop leadership skills:* The student-lead leadership structure allows everyone to engage in team activities on a higher of influence.

FUTURE PLANS

Lake Monsters Robotics is committed to expanding the program through growth in membership, sponsorship and education.

This year, Team 2635 had two students who mentored three FLL teams. In the next three years, we hope to have four students mentor FLL and Jr. FLL teams in Lake Oswego.

Starting this year, we collaborated with Lake Oswego Robotics, which is a non-profit group that supports FTC, FLL and Jr. FLL teams. One student created a website for Lake Oswego Robotics. We'll continue to support the website in the future.

It's our goal to maintain a sustainable program through sponsorships. This season, the team had 10 sponsors. Within the next three years, our goal is to have 15 sponsors. The team is mainly sponsored through volunteer matching grants provided by mentor companies. In the next three years, our goal is to increase involvement by parents' employers with matching funds for educational programs.

The team provides education and training to prepare members for future careers in engineering by offering a summer leadership camp to interested students. In the next three years, we would like to expand the educational offerings of Lake Monster U by having a more structured schedule and creating training materials that can be used in future seasons.

Create junior engineering programs to educate and recruit future members, and expand the reach of FIRST programs. The team has offered classes through the Lake Oswego Community School for younger students. In the next three years, the team wants to continue to offer this summer class with the support of mentors and team members.

SPONSORS

Lake Monsters Robotics is supported through the generous donations of foundations, local businesses and team families. In 2015, the following sponsors have contributed financial and in-kind donations valued at \$35,750.

*Boeing
FLIR
Intel*

*LAM Research
Mentor Graphics
Oregon Home Machinists*

*OR Dept. of Education
Really Big Video
Veris Industries*



2014 FINANCIAL STATEMENT

2014 Budget

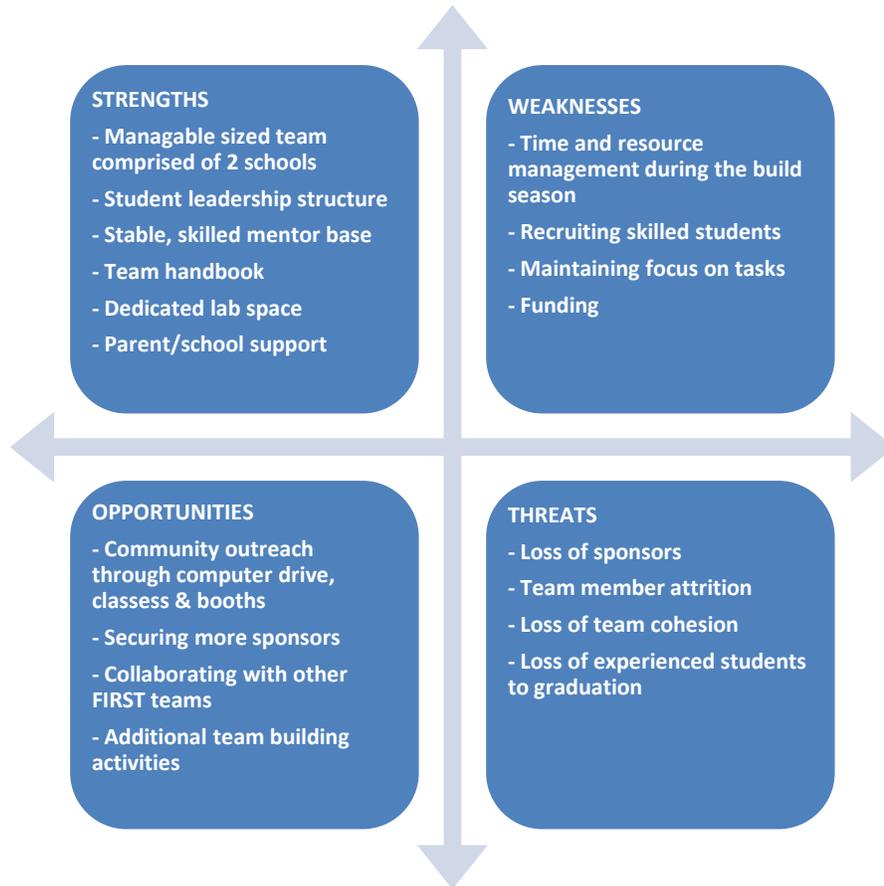
Registration Fees (3 events)	\$10,000
Robot Materials	\$8,761
Bunny Bot, Preseason Expenses	\$626
Miscellaneous Expenses	\$3,202
• Marketing Materials	
• Practice Field	
• Team Shirts	
Lab Materials and Maintenance	\$67
Total	\$22,656

2014 Funding Sources

Boeing	\$3,700
Mentor Graphics	\$2,500
Veris Industries	\$1,568
Intel	\$1,000
HP	\$1,000
Oregon Home Machinists	\$800
McAfee	\$500
FLIR	\$500
Student Community Events	\$628
Individual Donations	\$7,840
Student Activity Fees	\$6,000
Total	\$26,036



RISK ANALYSIS



During the 2013-2014 season, the Lake Monsters faced challenges with the retention of new team members. Up to that season, the team had operated without a team handbook, so student leadership roles and decision-making process guidelines were undefined, creating confusion and discord among team members and mentors.

At the end of summer 2014, the team came together to create a new team handbook that defines mentor and student roles, as well as outlining the RAPID decision-making process used in many professional engineering companies. These efforts have paid off during the 2014-2015 season. Student leaders have taken an active role in guiding new team members to successfully understand and implement engineering processes during the fall training season. "Who has the D" is an important question asked during the design process to help students effectively make decisions and avoid bottlenecks during the build season. Mentors have assisted in guiding team members in the new team handbook guidelines, creating a renewed atmosphere of camaraderie and joy in building awesome robots.

The team is currently preparing a proposal for funding through the Lakeridge High School ASB council to improve our dedicated lab space. We continue to benefit from the support of school leaders and parent volunteers.