

# 6328

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**MECHANICAL  
ADVANTAGE**

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LITTLETON MA

# Littleton Robotics FRC 6328 Business Plan 2017-2018

20 Harvard Road  
Littleton, MA 01460

[info@littletonrobotics.org](mailto:info@littletonrobotics.org)  
[littletonrobotics.com](http://littletonrobotics.com)

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# Executive Summary

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## Mission Statement

*"Good is the enemy of great"*

Mechanical Advantage helps prepare students in Littleton and the surrounding communities to pursue careers in science and technology by forging partnerships of mutual respect with mentors, parents, sponsors, and our community. We focus on collaborative learning within the team and with our larger community to build confidence and skills in teamwork, leadership, accountability, and communication as well as technical and non-technical work skills using the real-world engineering projects of FIRST. We strive to adhere to our team motto "Good is the Enemy of Great," making sure to not settle for anything less than our best.

*Team Establishment: June 2016*

## What is FIRST?

Accomplished inventor Dean Kamen founded FIRST® (For Inspiration and Recognition of Science and Technology) in 1989 to inspire an appreciation of science and technology in young people. Based in Manchester, N.H., FIRST designs accessible, innovative programs to build self-confidence, knowledge, and life skills while motivating young people to pursue opportunities in science, technology, and engineering. With support from over 200 of the Fortune 500 companies and more than \$25 million in college scholarships, the not-for-profit organization hosts the FIRST® Robotics Competition for students in Grades 9-12.



Students work with professionals across a wide range of disciplines including hardware and software engineering, strategy, design, and business to build a robot and compete in a game following rules established each year by FIRST. Each team has 6.5 weeks to design, build and tests their robots before they head out to competitions regionally and if they succeed, globally. The short timeframe and the intense teamwork required to get a robot operational is an incredible experience for students – it imitates many of the aspects of real life career experiences.

## Location and Current Team Sponsors

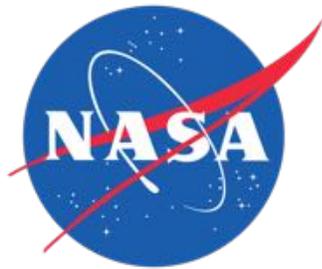


Our team is located in Littleton, MA. We are governed by the non-profit organization created by the team founders, Littleton STEM Educational Foundation. We established our team headquarters this year at the Patriot Beverages campus in Littleton. Our workspace is a 4,200-square foot office building that includes a large machine shop, robot assembly area, practice field



space, and multiple conference rooms and offices. This space was donated to us by our team's top sponsor, Patriot Beverages.

In addition to Patriot Beverages, our major team sponsors include NASA, Bose, ZOLL Medical, iRobot, Workers Credit Union, Viasat, and BAE Systems. A full list of our team sponsors can be found in the **Team Sponsors** section.



## Team Impact/Outreach

Since our team's inception in June 2016, we have made a substantial impact on the Littleton and greater Boston area communities. In our rookie season, we participated in 15 community events, including Littleton's Third Thursday, Country Fair, Trunk or Treat, and Holiday Bazaar. This season, we have participated in 28 outreach events so far, and expanded our reach to include the greater Boston area in addition to Littleton. Key outreach events this season included Boston's Greenfest, Boston Youth Exposition, RoboExpo at the Pheasant Lane Mall in Nashua, NH and Discover STEM Night in Acton, MA.

In addition to traditional outreach events, our team has established many of our own outreach programs to reach unique communities. These major community programs include our Girl Scouts robotics badge events and our Best Buddies STEM outreach program. More information on these programs can be found in the Team **Impact/Outreach** section.

Furthermore, we established a FIRST Lego League program within our organization and had 3 teams compete in the Hydrodynamics season. These teams were founded, funded and mentored by our FRC team. Our FRC team members dedicated over 400-man hours to mentoring this season! We are also helping 4 organizations start their own FLL programs, including C.Y.S.T.E.M and the Panineeya Mahavidyalaya Public School in Hyderabad, India.

Lastly, we have been mentoring FRC Team 6812 – Andover Snowflakes in their rookie season, as well as assisting FRC Team 6731 – Record Robotics with fundraising and media/community outreach.

**Relationships & Information Regarding Current Sponsors**

Our team makes sure to maintain close relationships with our team sponsors. Some of our major partnerships are summarized below.

Sponsor/Partner	Impact
Patriot Beverages	Team’s top sponsor: donated 4,200-sqaure foot workspace to team.
Bose Corporation	In addition to monetary team sponsorship, Bose provides team with manufacturing services including laser cutting, water-jetting and CNC routing.
iRobot	Waterjets parts for our robot, teaching our students how to design for manufacturability. Committed to long-term partnership with team to cut parts on an annual basis.
SMC	Donated Bridgeport mill for the team’s machine shop.

**Summary of Team Growth**

Our team has grown exponentially since its inception. In our first season, we had 20 students as well as 12 mentors. However, 50% of our team members were seniors, creating a major need for continued growth in the 2017-2018 season. Our team now has 26 members and 12 mentors, and 9 of these mentors were retained from the 2016-2017 season. We have also grown in number of areas our students come from. Last season, almost all of our students came from Littleton Public Schools. This year, we have students from 8 different schools and 5 towns, including Acton, Bolton and Westford.

In addition to team member growth, our team has made major progress with our community outreach events, FLL program and sponsor connections. Our most notable achievement is obtaining our partnership with Patriot Beverages as our top sponsor, as this has set our team up for long-term sustainability and future team growth. It has also allowed us to establish ourselves as a major part of the Littleton community, as well as a center for STEM education programs in the area. Our strategy for obtaining this partnership with Patriot Beverages involved growing our community outreach programs exponentially and working directly with Littleton town government, as well as establishing our FLL teams under our non-profit organization. Despite being extremely active in our community last season, we grew our number of team community outreach hours by 57%, totaling 87 team hours and over 600-man hours just between June 2017 and December 2017. We also established our FLL program this season, and have fully integrated FLL into our team.

We worked tirelessly to get our name and the FIRST program out into the community, and our efforts did not go unnoticed. We quickly caught the attention of the Littleton Board of Selectmen, who partnered with our team to secure our workspace with Patriot Beverages. Our push for growth in all areas of our team – student members, community outreach, FLL and sponsor connections, has set our team up for long term-sustainability, and established Littleton Robotics as an integral part of our community.

## Summary of Future Team Plans

Despite having made a number of major achievements this season, our team still has big plans for future team growth. We have connected with the MA Jr FLL and MA FLL directors, and will be hosting a Jr FLL Expo on April 7, 2018 and an FLL qualifier event on December 8, 2018. We also will be partnering with the Discovery Museum in Acton, MA to create a museum displayed centered around the FIRST program. Furthermore, we plan to continue mentoring rookie FRC teams, and assisting other organizations in starting their own FLL teams. Lastly, we will be focusing efforts on recruiting more females to our team, as well as growing our FLL to FRC transition program to help more students make the jump from FLL to FRC. The specific steps we will take to make these plans happen are outlined in the **Future Plans** section.

## Team Overview

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### Team History

Our team was established in June 2016 in Littleton, MA. Our founder David Provost had the idea of starting a FIRST team in Littleton for several months but was unsure of how to make it happen. Like the creation of many other FRC teams, at first it seemed to be all talk and little action. Shortly after, however, David encountered two recent WPI graduates who had participated in FIRST in high school and college and were looking for their next big challenge in FIRST. The three met and they made their idea a reality. Within weeks, our brand new FIRST team in Littleton took off, hosting the first student meeting with 11 student members and establishing ourselves as a community-based team and non-profit organization, the Littleton STEM Educational Foundation.



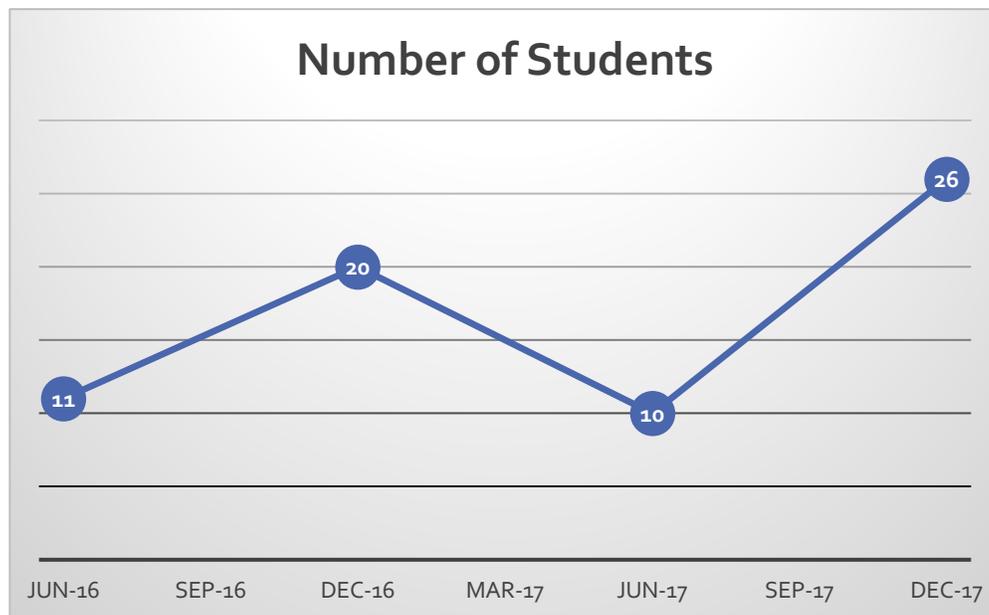
Our team saw great success in our rookie season, bringing home 5 awards, including an event win at the Southern New Hampshire District and the New England Rookie Allstar Award, ranking 10th overall in New England, and qualifying for the World Championship in St. Louis. Our highly successful first season propelled the team forward in the offseason that followed, resulting in major growth in our community outreach efforts, mentorship of rookie FRC teams, and the creation of our FLL program.

The major push for continued team growth in conjunction with our successful first season got the attention of major stakeholders within the Littleton community, including the town selectmen. We worked closely with Chair of the Board of Selectmen, Chuck DeCoste, to obtain our new workspace donated by Patriot Beverages. This space will serve as the headquarters for both our FRC and FLL teams, and is also large enough to make it a viable place for summer camp programs, practice FLL events and a Jr. FLL exposition. Obtaining this was a major step towards long-term sustainability for our team and establishing

a center of STEM educational opportunities in the area, as well as a springboard for continued team growth.

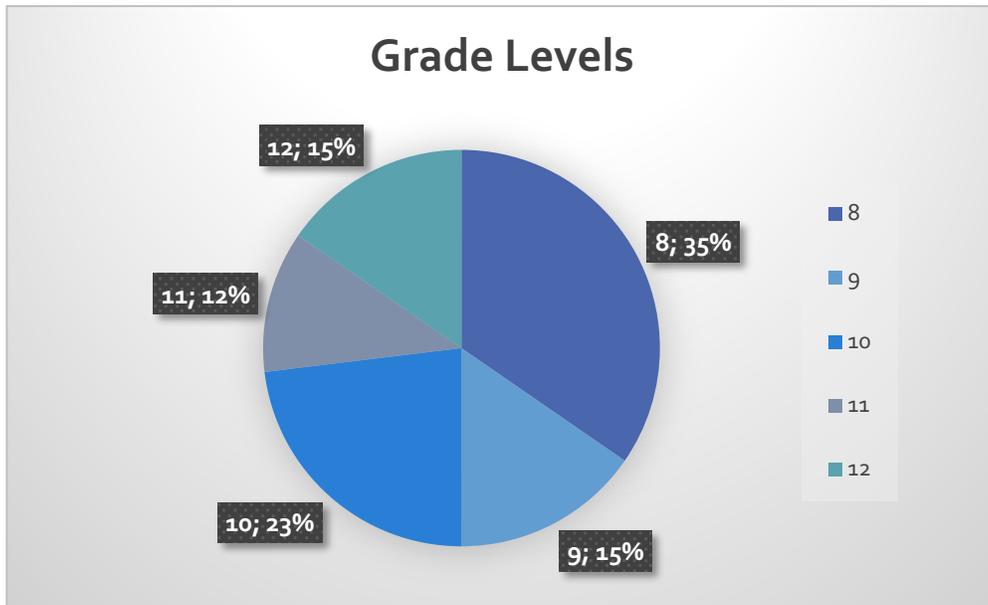
## Student Team Members

We have seen growth with the number of student members on our team, starting with 11 at our team's inception and growing to 20 members in the 2017 season. Last season our team was very senior heavy, resulting in the loss of 50% of our team members. We recruited 16 new members to the team this year, bringing our totals to 26 members.

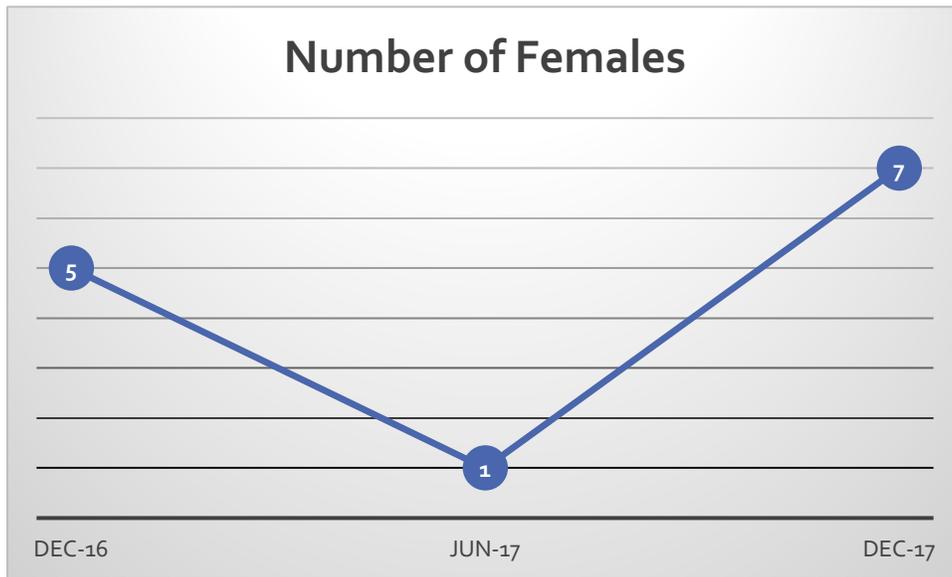


This season, we decided to open our team up to students in 8th grade. We implemented an FLL-to-FRC transition program to help our 8th grade FLL members make the step between the two programs, and it was highly successful in recruiting younger students to the team. It also helped with recruiting more females, as our team found that females tend to be less intimidated by STEM in middle school than they are in high school. By getting girls involved at a younger age, they will be more likely to participate in FRC all throughout high school, having been exposed at an age when they do not feel as intimidated yet. More details about our transition program can be found in our **FIRST Lego League Business Plan**.

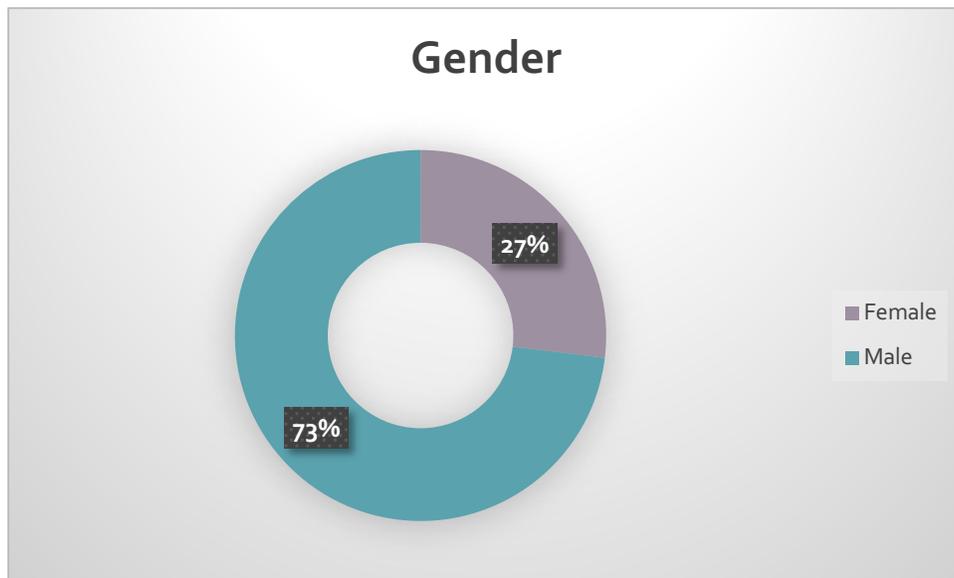
Including 8th graders has proven to be very successful for student growth and team sustainability. After losing half of our team last season, we realized the importance of recruiting younger students. Our team now has the advantage of having 50% of our members in 8th and 9th grade. These students will be able to participate in FRC for 4-5 years, increasing their overall exposure to FIRST and STEM, as well as allowing them to gain technical and non-technical experience over several years.



At the end of last season, we only had 1 female member on the team as the other 4 had graduated. Since then, we have seen large growth in number of females, increasing to 7 total female members on the team.



Our team is currently 27% female and 73% male, as seen in the diagram below. With the implementation of our FLL-to-FRC transition program, we expect our male to female ratio to continue increasing. On our FLL teams, 40% of our members this season were female. Since we have observed more females in the FLL program and have created a direct feeder system to our FRC team, our ratio should increase as more FLL members move up.



Among our 12 mentors, 4 are female and all working directly with technical information in a variety of STEM related industries. These women are role models for our female students and work to support them in their aspirations, empathize with their struggles to succeed in traditionally male-dominated fields, and show possibilities in future careers.

Additionally, we established a Girl Scouts Badge robotics badge program for 2<sup>nd</sup>-5<sup>th</sup> grades with the Littleton Girl Scout troops, and will be repeating this event with the Westford troops in the spring and with Littleton again in the fall. This program involved exposing them to aspects of FRC and FLL. This event is an effective feeder to our FIRST Lego League program. This will further increase number of females on the FRC team in the future. At the end of the program in the fall, we asked the girls who wanted to do FLL, and nearly all of them raised their hands! The graphic below shows the process we are using to keep females involved in STEM and robotics from 2<sup>nd</sup> grade on.



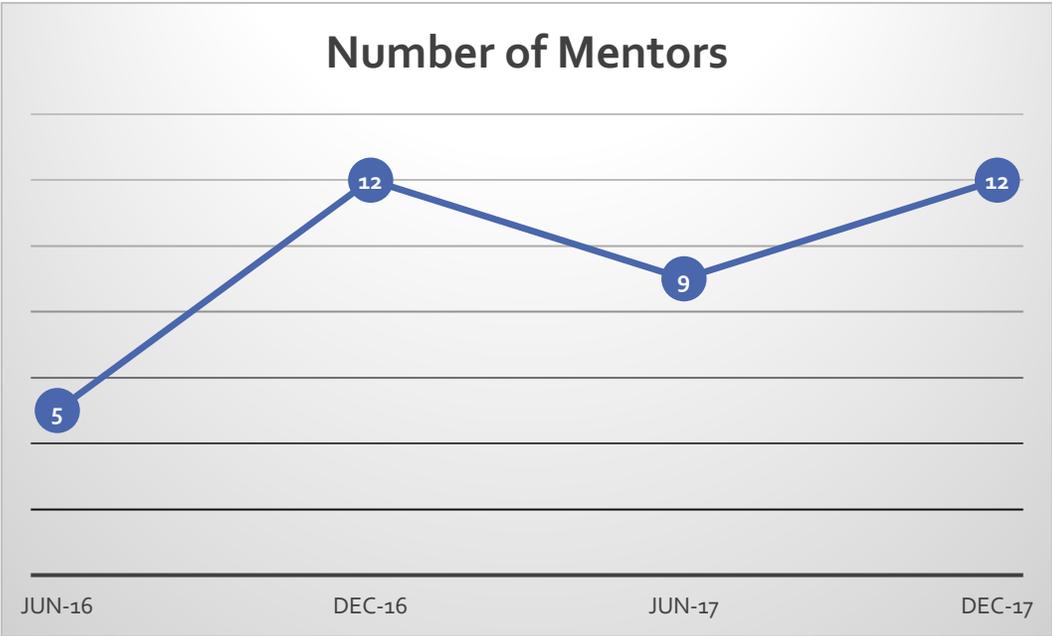
Our team is inclusive and has worked with several special needs students, and their families, who are interested in joining the team, both on FLL and FRC. This ensures anyone who wants to can make a meaningful contribution to the team and have the opportunity to learn.

Our students come from 8 different schools in Littleton and surrounding towns. This distribution is shown in the table below.

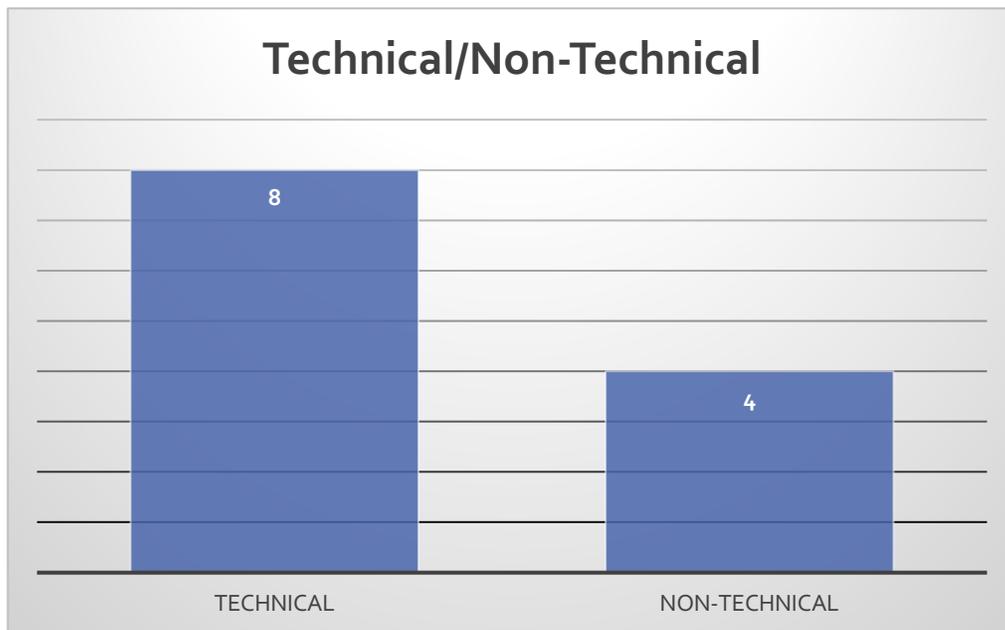
School	Town
Littleton Public Schools	Littleton
Acton-Boxborough Public Schools	Acton, Boxborough
Westford Public Schools	Westford
Florence Sawyer School	Bolton
Advanced Math and Science Academy	Marlborough
Parker Charter School	Devens
St. John's	Shrewsbury
Notre Dame Academy	Tyngsborough

### Team Mentors

Our mentor growth has been relatively steady since the start of the 2017 season. Following the conclusion of the 2017 season, some of our mentors had students who had graduated, resulting in a slight decrease from 12 to 9 mentors. However, we recruited 3 new mentors, including our robot inspector at the World Championship! This creates a favorable student to mentor ratio of approximately 2:1. This allows for students to work in small groups guided by mentors, but not have so many mentors that it creates an overwhelming environment.



We have both engineering mentors and non-engineering mentors, as seen in the graph below. Our technical mentors come from varying engineering backgrounds, including mechanical, electrical, computer and environmental engineering. Our non-technical mentors have backgrounds in business, management and public relations. Our diverse mentor backgrounds ensure that all students on the team have necessary support and guidance in any area they choose to focus in. Our mentors also make sure to provide our students with information on what careers are like in their varying backgrounds, helping them see where a degree in a STEM field could take them and how understanding technical information is critical even in non-technical fields.



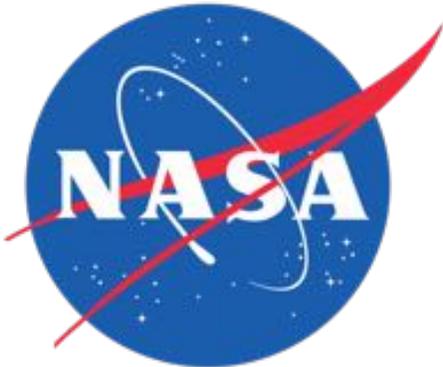
Our diverse mentor group gave us the idea to host a STEAM Careers Night this past fall, where we set up tables for different engineering, science and arts-based careers students could go into. More information on our STEAM Careers Night can be found in the **Team Impact/Outreach** section.

Four of our FRC mentors sit on the officer board of the Littleton STEM Educational Foundation, the governing organization for our team, along with a fifth at-large board member. The officer board consists of President, Vice President, Treasurer, Clerk, and Member At-Large. These individuals oversee the team management, finances, and policies.

## Team Sponsors

The team has 29 sponsors to date, which we have highlighted below. We utilize creative techniques to ensure our sponsors stay engaged and involved in our team, such as updates through newsletters, press releases following major team events, as well as recognition on our social media pages. At our second-annual community pasta dinner that we hosted in November, we recognized all our sponsors during our team presentations. We also hosted a community open house in our new work space to recognize Patriot Beverages for their gracious donation and continued support of our team. Additionally, we hosted our second-annual sponsors open house at the end of build season for our major team stakeholders. Lastly, we gave a team presentation at ZOLL Medical past spring, and demoed our robot for their employees.

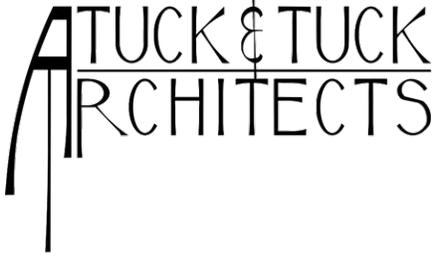
We have retained several of our corporate sponsors from last season, including ZOLL Medical, Workers Credit Union, Bose Corporation and iRobot. We have also gained new sponsors, such as Viasat, BAE Systems and MIT Lincoln Laboratory.

Level	Sponsor	Company Description
Diamond - \$20,000+	<b><i>Patriot Beverages</i></b>	Patriot Beverages is a Pepsi bottling plant with campuses in Littleton and Ayer, MA.
Platinum - \$10,000 - \$19,999	<b><i>Bruce &amp; Sue Bonner</i></b>	Individual Donor
Gold - \$5,000 – \$9,999	 <b>NASA</b>	The National Aeronautics and Space Administration.
	 <b>Allego Inc.</b>	<b>Allego, Inc.</b> develops a mobile-first sales learning platform to help workforces share content and improve performance using mobile, video, and peer learning.

	 <p><b>ZOLL Medical</b></p>	<p>ZOLL is focused on improving outcomes with novel resuscitation and acute critical care technology. Our medical products and software solutions help clinicians, EMS and fire professionals, lay rescuers, and the military provide life-saving care every day. ZOLL delivers technology that advances emergency care and benefits patients.</p>
<p>Silver - \$2,000-\$4,999</p>	 <p><i>Littleton Electric Light and Water Department</i></p>	<p>Littleton's electric, drinking water, and sewer provider.</p>
	 <p><i>Workers Credit Union</i></p>	<p>Workers Credit Union, a customer-focused credit union in Massachusetts, offers convenient financial services, making it one of the top credit unions in MA.</p>
	 <p><i>Bose Corporation</i></p>	<p>Bose Corporation is an American privately held corporation, based in Framingham, Massachusetts, that designs, develops and sells audio equipment.</p>
	 <p><i>Viasat, Inc.</i></p>	<p>Viasat Inc. is a communications company based in Carlsbad, California, with additional operations across the United States and worldwide.</p>

	 <p><i>BAE Systems Inc.</i></p>	<p>BAE Systems Inc. BAE Systems Inc. is the wholly owned U.S. subsidiary of BAE Systems plc, the world's second biggest defense company.</p>
<p>Bronze - \$500- \$1,999</p>	 <p><i>iRobot</i></p>	<p>iRobot is at the forefront of developing technologies in the areas of mapping and navigation, human-robot interaction, and physical solutions. We seek to build an ecosystem of robots and data to enable the smart home, both through internal initiatives and by building strategic external partnerships.</p>
	 <p><i>Vallas &amp; Arrison, PC</i></p>	<p>Vallas &amp; Arrison, PC, provides individual and business tax and accounting services performed by certified public accountants that outperform the norm.</p>
	 <p><i>Solidworks</i></p>	<p>Dassault Systèmes <b>SOLIDWORKS</b> Corp. develops and markets 3D CAD design software, analysis software, and product data management software.</p>
	 <p><i>MBA Team</i></p>	<p>MBA Team, Inc. is a full-service public relations, internet marketing and design firm.</p>
	 <p><i>Raytheon - BBN Technologies</i></p>	<p>Raytheon BBN Technologies is one of Raytheon's premiere research and development centers.</p>

	 <p><b>LINCOLN LABORATORY</b> MASSACHUSETTS INSTITUTE OF TECHNOLOGY</p> <p><i>MIT Lincoln Laboratory</i></p>	<p>The MIT Lincoln Laboratory, located in Lexington, Massachusetts, is a United States Department of Defense research and development center chartered to apply advanced technology to problems of national security.</p>
	 <p><b>Main Street</b> BANK</p> <p><i>Main Street Bank</i></p>	<p>Local community savings bank.</p>
	 <p><b>NVIDIA</b></p> <p><i>NVIDIA</i></p>	<p>Nvidia Corporation is an American technology company incorporated in Delaware and based in Santa Clara, California.</p>
	 <p><b>SMC</b></p> <p><i>SMC Corporation</i></p>	<p>SMC Corporation is a Japanese TOPIX Large 70 company founded in 1959, which specializes in pneumatic control engineering to support industrial automation.</p>
	 <p><b>Microsoft</b></p> <p><i>Microsoft Corporation</i></p>	<p>Microsoft Corporation is an American multinational technology company that develops, manufactures, licenses, supports and sells computer software, consumer electronics, personal computers, and service</p>
	 <p><b>Merrill Lynch</b> Bank of America Corporation</p> <p><i>Merrill Lynch</i></p>	<p>Merrill Lynch Wealth Management is a wealth management division of Bank of America.</p>

	 <p><b>New England Clean Energy</b> <i>Delivering Better Alternatives</i></p> <p><b>New England Clean Energy</b></p>	<p>New England Clean Energy <i>delivers quality solar power solutions for Massachusetts homes and businesses.</i></p>
	 <p><b>Tuck &amp; Tuck Architects</b></p>	<p>Tuck and Tuck Architects is a full-service architecture firm specializing in contextual New England residential and commercial architecture.</p>
	<p><b>Littleton Rotary Club</b></p>	<p>Local rotary organization.</p>
	<p><b>The Provost Family</b></p>	<p>Individual Donor</p>
<p>Steel - \$100 - \$499</p>	 <p><b>Total Phase, Inc.</b></p>	<p>Total Phase, Inc. develops, manufactures, and sells cross-platform embedded systems development tools for engineers in companies, small businesses, research institutions, universities, and government agencies.</p>
	 <p><b>Ed's Weenies</b></p>	<p>Local hot dog stand in Littleton, MA.</p>
	 <p><b>Dav-Tech Plating</b></p>	<p>Dav-Tech Plating Inc. specializes in metal finishing. They design, develop and produce high-quality, high-performance coatings for products used in the defense, medical, automotive and electronics industries.</p>
	<p><b>Cheryl Temple</b></p>	<p>Individual Donor</p>

# Team Management

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## Team Membership

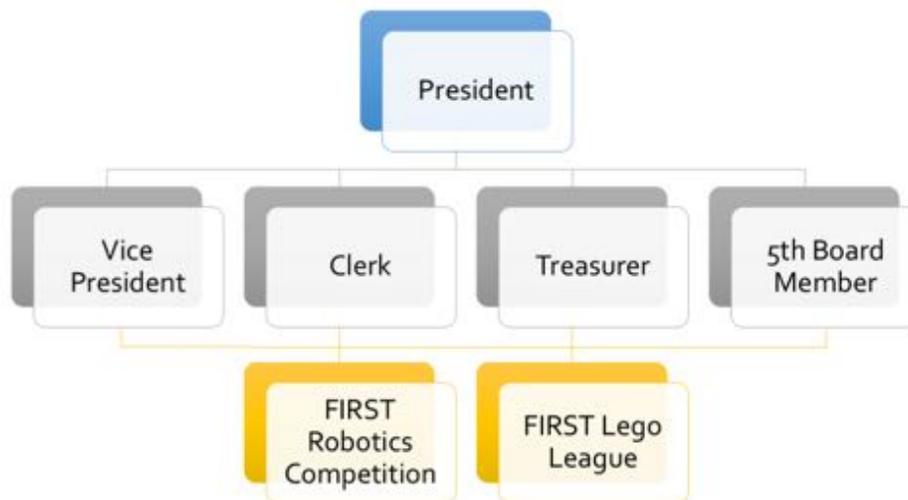
Team membership is open to any students in grades 8-12 who would like to join the team. We have a \$150 program fee, which goes towards team shirts, our iconic team bucket hats, and robot supplies. We had a reduced minimum donation of \$35 for students in the FLL-to-FRC transition program, as their families already paid a \$75 FLL program fee.

We held multiple information sessions throughout the summer and fall to recruit students to the team. By participating in community outreach events outside of Littleton as well, we were able to recruit students from other towns and school districts.

## Team Structure

Our team is organized under a non-profit organization, the Littleton STEM Educational Foundation (LSEF). We have 5 officers who make up the LSEF board: president, vice president, clerk, treasurer and one at-large board member. LSEF oversees all operations of our FRC and FLL teams.

### Littleton STEM Educational Foundation Structure



Our FRC team is organized under our technical manager and team manager. They oversee the technical and non-technical aspects of the team, as well as our student leader board. We added 5 student leader positions this season: Programming & Electrical Lead, Mechanical Lead, Business & Community Lead, Scouting Systems Lead and Strategy Team Lead. The figure below shows how our team is structured. Descriptions of the sub-teams are below the organizational chart.

### FRC Team 6328 – Mechanical Advantage Team Structure



**Programming & Electrical Team:** This team is directed by the student programming & electrical team lead and the head programming mentor. They are in charge of writing all the robot code, testing and tuning the robot, wiring the robot, mounting the electronics, and determining which sensors to use on the robot. This team coordinates with mechanical and electrical sub-teams to ensure streamlined process during the robot build.

**Mechanical Team:** This team is directed by the student mechanical team lead and the technical manager. They are in charge of the design/CAD of the robot, machining parts, assembling the robot and building field elements. This group works with the programming and electrical team to ensure the appropriate code is written and the electronics have proper mounting space.

**Community & Business Team:** This team is directed by the student community and business lead and the team manager. This team oversees the fundraising group, who are responsible for planning team fundraisers, giving sponsor presentations and submitting grant applications. The community outreach team is also under this umbrella. This team is split into 3 categories: traditional outreach events, team-planned outreach events, and FIRST Lego League outreach efforts, including mentorship of the Littleton FLL teams. They oversee awards submissions and mentoring of other FRC teams as well. This team also works closely with the 501(c)3 president and treasurer.

**Scouting and Strategy Team:** This team develops the scouting system used at competition, scouts other teams at the events, assists in planning match strategy and develops the team pick list for alliance selection at events. This team is organized by 2 student leaders – scouting systems lead and strategy team lead, as well as the scouting & strategy team head mentor.

**Public Relations Team:** This team manages our social media accounts, organizes newspaper publications, updates our website, and takes photos and videos of the team during major events. This team is led by a parent volunteer.

### Competition Team Roles

In addition to team structure describe above, we also have specific competition team leadership roles for students. Our competition team is split up into 3 sections: drive team, pit crew, and scouting and strategy team. We established several leadership roles under these sub-groups to keep our team efficient and

organized during competitions, but also to get younger students exposed to leadership opportunities. This will give them experience when moving up to the student leader positions on the team in future years. The graphic below lists our different competition team roles, and how they all work together to make our events successful.



## Team Media

We have developed a media plan for our FLL and FRC teams that includes ongoing relationships with local newspapers and the community cable TV station. Our plan includes multiple media types, divided into 4 categories:

1. Newspaper Publications
2. Cable TV Segments
3. Social Media Platforms
4. YouTube Videos

Since our team's inception, we have been featured in 14 newspaper articles. Being featured in several articles have been an extremely effective way of getting our name out in the community and generating buzz about the team. A list of these publications is shown below.

### Newspaper Articles

<b><i>Littleton Robotics hosts open house at new location</i></b>	
February 28 <sup>th</sup> , 2018	Littleton Independent
<a href="http://littleton.wickedlocal.com/news/20180228/littleton-robotics-host-open-house-at-new-location">http://littleton.wickedlocal.com/news/20180228/littleton-robotics-host-open-house-at-new-location</a>	
<b><i>Littleton FIRST Robotics Competition team opens build season</i></b>	
January 25, 2018	Littleton Independent
<a href="http://littleton.wickedlocal.com/news/20180123/stronglittleton-first-robotics-competition-team-opens-build-seasonstrong">http://littleton.wickedlocal.com/news/20180123/stronglittleton-first-robotics-competition-team-opens-build-seasonstrong</a>	
<b><i>Littleton Robotics' FIRST Lego League teams advance to state championship</i></b>	
December 8, 2017	Littleton Independent
<a href="http://littleton.wickedlocal.com/news/20171206/littleton-robotics-first-lego-league-teams-advance-to-state-championship">http://littleton.wickedlocal.com/news/20171206/littleton-robotics-first-lego-league-teams-advance-to-state-championship</a>	
<b><i>Robotics teams host Girl Scouts badge event</i></b>	
October 20, 2017	Littleton Independent
<a href="http://littleton.wickedlocal.com/news/20171018/littleton-robotics-teams-host-girl-scouts-badge-event">http://littleton.wickedlocal.com/news/20171018/littleton-robotics-teams-host-girl-scouts-badge-event</a>	
<b><i>Littleton's FIRST robotics team's rookie season ends at World Championships</i></b>	
May 17, 2017	Littleton Independent
<a href="http://littleton.wickedlocal.com/news/20170517/littletons-first-robotics-teams-rookie-season-ends-at-world-championships">http://littleton.wickedlocal.com/news/20170517/littletons-first-robotics-teams-rookie-season-ends-at-world-championships</a>	

<b><i>Littleton officials get 'pied' for robotics team fundraiser</i></b>	
May 1, 2017	Littleton Independent
<a href="http://littleton.wickedlocal.com/photogallery/WL/20170501/NEWS/501009980/PH/1">http://littleton.wickedlocal.com/photogallery/WL/20170501/NEWS/501009980/PH/1</a>	
<b><i>Robotics team creates Mechanical Advantage</i></b>	
April 18, 2017	The Lowell Sun
<a href="http://www.lowellsun.com/news/ci_30929035/robotics-team-creates-mechanical-advantage">http://www.lowellsun.com/news/ci_30929035/robotics-team-creates-mechanical-advantage</a>	
<b><i>Littleton's FIRST robotics team wins Rookie All-Star Award, qualifies for World Championship</i></b>	
April 17, 2017	Littleton Independent
<a href="http://littleton.wickedlocal.com/news/20170417/littletons-first-robotics-team-wins-rookie-all-star-award-qualifies-for-world-championship">http://littleton.wickedlocal.com/news/20170417/littletons-first-robotics-team-wins-rookie-all-star-award-qualifies-for-world-championship</a>	
<b><i>Littleton's FIRST robotics team wins at southern New Hampshire competition</i></b>	
April 11, 2017	Littleton Independent
<a href="http://littleton.wickedlocal.com/news/20170411/littletons-first-robotics-team-wins-at-southern-new-hampshire-competition">http://littleton.wickedlocal.com/news/20170411/littletons-first-robotics-team-wins-at-southern-new-hampshire-competition</a>	
<b><i>Littleton Robotics Team is Only Just Gearing Up</i></b>	
March 21, 2017	Littleton Independent
<a href="http://littleton.wickedlocal.com/news/20170321/littletons-robotics-team-is-only-just-gearing-up">http://littleton.wickedlocal.com/news/20170321/littletons-robotics-team-is-only-just-gearing-up</a>	
<b><i>Littleton Robotics Open House</i></b>	
February 27, 2017	The Lowell Sun
<a href="http://photos.lowellsun.com/2017/02/26/littleton-robotics-open-house/#1">http://photos.lowellsun.com/2017/02/26/littleton-robotics-open-house/#1</a>	
<b><i>Littleton robotics team gears up</i></b>	
January 22, 2017	The Lowell Sun
<a href="http://www.lowellsun.com/local/ci_30743429/littleton-robotics-team-gears-up">http://www.lowellsun.com/local/ci_30743429/littleton-robotics-team-gears-up</a>	
<b><i>Littleton Robotics team opens competition season</i></b>	
January 18, 2017	Littleton Independent
<a href="http://littleton.wickedlocal.com/news/20170118/littleton-robotics-team-opens-competition-season">http://littleton.wickedlocal.com/news/20170118/littleton-robotics-team-opens-competition-season</a>	
<b><i>FIRST Robotics team forms in Littleton</i></b>	
July 28, 2016	Littleton Independent
<a href="http://littleton.wickedlocal.com/news/20160728/first-robotics-team-forms-in-littleton">http://littleton.wickedlocal.com/news/20160728/first-robotics-team-forms-in-littleton</a>	

## TV Programs

We also connected with Bill Vales of Littleton Cable TV, and were featured in 2 segments on his “Fun with Science” channel. The first segment featured our FLL teams, and a more detailed description of this show can be found in our **FLL Business Plan**. The second segment was about our FRC team near the end of the 2018 build season. We showed Bill our in-progress 2018 robot, and talked about how the FRC program works.

<b><i>Fun With Science Littleton Robotics (FRC)</i></b>	
February 2018	LCTV
<b><i>Fun With Science Littleton Robotics (FLL)</i></b>	
October 2017	LCTV

## Social Media

Our team is extremely active on multiple social media platforms, including Facebook, Instagram and Twitter. We post regular updates about our FLL and FRC teams, and have connected with new members, potential sponsors and other FIRST teams through our pages. Social media is a great platform for spreading the FIRST message and details about our team to a large audience.



We are also active on YouTube, creating multiple videos about our teams each season. In 2017, we created our first-ever robot reveal video, and got over 6,200 views in 27 different countries! At the end of the 2017 season, we posted a season wrap video. We also created a season wrap video for our FLL teams at the end of the Hydrodynamics season. At the end of the 2018 season, we created a robot teaser video.

Uploads [PLAY ALL](#)



## SWOT Analysis

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Our team has set ourselves up for long-term sustainability. Our recent partnership with Patriot Beverages is a major strength of our team. They have committed to a long-term sponsorship of our program, guaranteeing us a workspace with plenty of room to grow for years to come. Additionally, our team has a very active and wide-spread community outreach program. We have developed strong community support as a result and are very well known in Littleton and the surrounding towns. In fact, our FLL program was so successful in year 1, we already have a waitlist for our summer 2018 program! Furthermore, with the development of our FLL program, we created a direct feeder system to FRC. Our FRC and FLL teams work closely together year-round, so FLL members have a clear path to robotics in high school. And by working directly with FRC team members who serve as mentors-in-training, FLL team members come into the FRC program already knowing students and mentors and feeling comfortable with the people and program.

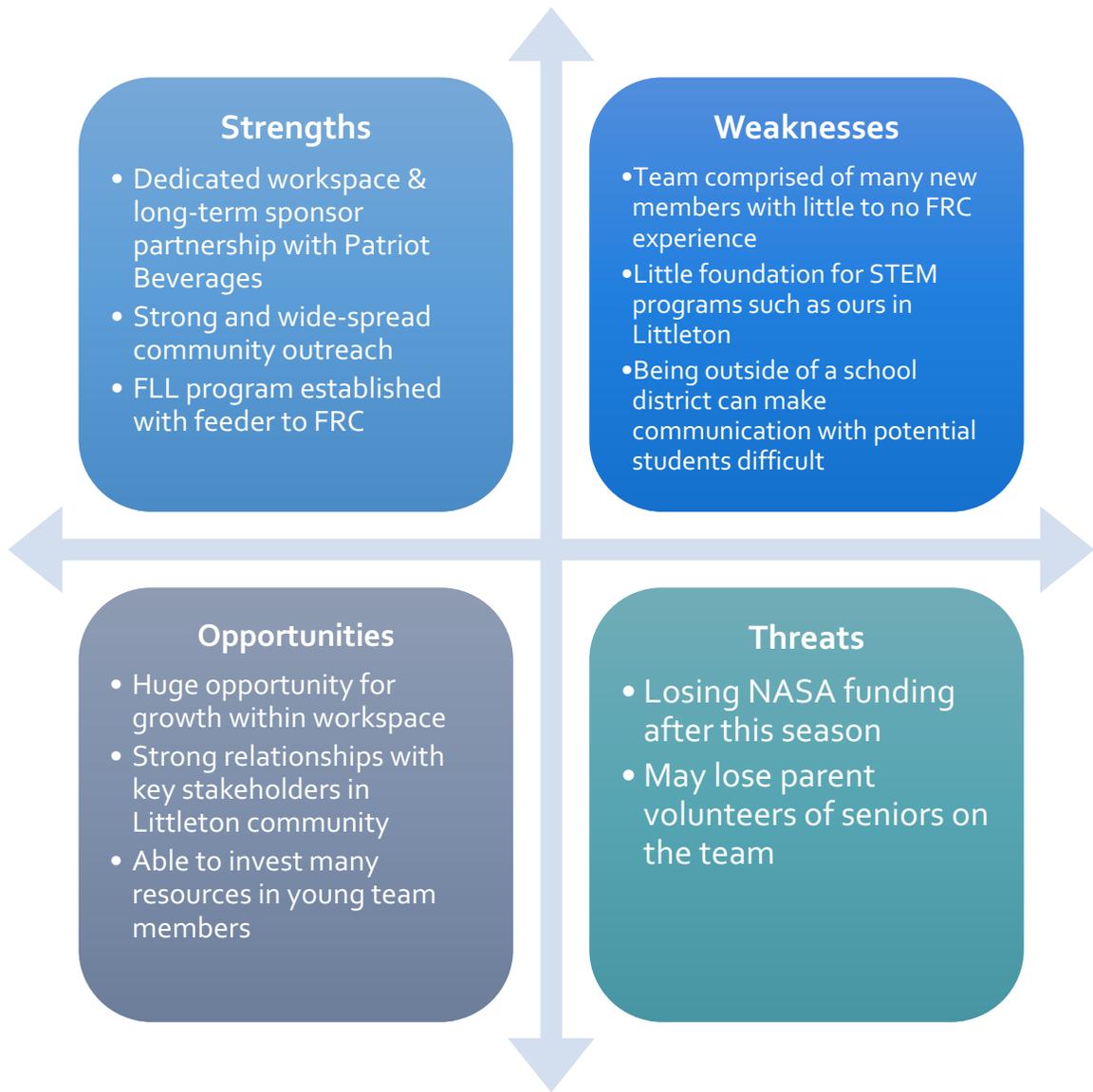
A weakness of our team currently is that 50% of our members are in 8<sup>th</sup> and 9<sup>th</sup> grade and have little to no FRC experience. This made delegating tasks during build season tricky, and required more mentor guidance than with some of our senior members last year. However, we are making sure to get our younger students extensive technical training as they have 3-4 additional years to participate in the program. By the time they are seniors, they will be highly skilled and able to complete many tasks on their own. Another team weakness is that there is very little foundation for STEM programs like ours in Littleton. However, by starting the program from scratch, we have the opportunity to set the framework for sustained success, and influence and promote STEM education in Littleton through programs such as the Girl Scouts robotics badge event and our Best Buddies collaboration. Additionally, being a community team not linked with a particular school district can make it challenging to recruit new students to the team. Our extensive outreach efforts this season helped up overcome this challenge however.

A threat to our team is that we will not receive NASA funding after this season. To mitigate this, we established a minimum team donation. We also established new sponsors this season, including BAE Systems and Viasat and set a goal of reserving funds to seed the next season. Another potential threat to the team is losing parent volunteers when their child graduates. By recruiting many younger students to the team this season and encouraging their parents to get involved, we have minimized this risk.

Our team has unique opportunities to grow as well. As stated before, our new workspace is 4,200 square-foot and comprised of mainly large, open spaces. Our machine shop in particular has a significant amount of room to expand. We currently have a Bridgeport mill, lathe, table saw and CNC router. We have plans to expand our shop to include more tools, such as additional mills and a larger CNC router. We have also developed a strong partnership with the Littleton Board of Selectmen, who are key stakeholders in the community. They assisted us in getting our new workspace and are willing to help us in future endeavors as well. This connection can assist us in attaining new equipment, setting up new community outreach events, and acquiring new team sponsors.

The figure below summarizes our SWOT analysis.

# SWOT Analysis Diagram



## Team Impact/Outreach

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Our team's outreach program is split into 4 main sections: traditional outreach events, team outreach programs, FLL outreach, and mentorship of other FRC teams. Our FLL business plan goes over our FLL outreach program, and the other 3 sections are summarized below.

### **Traditional Outreach Events**

Our team attends many traditional community outreach events. These events are categorized as general community gatherings run and/or planned outside of the team.

Event	Description	Frequency
<p style="text-align: center;"><b>Third Thursday</b></p> 	<p>Third Thursday, a community event designed to showcase local organizations and businesses combined with fun family activities, was the first outreach event our team ever attended. It is during the summer in Littleton, occurring on the 3<sup>rd</sup> Thursday every June, July and August. Our team attended all 3 this past summer, and developed a following of young kids who want to join our team when they are older. Our 2017 robot became known as the “green ball machine” around town! We also connected with many parents interested in starting Jr. FLL teams in town.</p>	<p style="text-align: center;">4</p>
<p style="text-align: center;"><b>Country Fair</b></p> 	<p>The Littleton Country Fair is an annual community event held in Faye Park in September. Our team attended this event in 2016 and 2017. This fall, we demoed our 2017 robot, bot-bot, and even got the kids operating the shooter and gear mechanisms. We also raffled off some Lego sets which was very popular with the young kids in attendance.</p>	<p style="text-align: center;">2</p>

**Table Sitting**



We set up tables outside of local businesses in Littleton throughout the year, including a grocery store, ice rink, and frozen yogurt shop. This is an easy way to raise team awareness and spread the message of FIRST, as well as raise money for our team through raffles and direct donations. These events have proven to be one of our easiest and most effective outreach methods!

7

**Trunk or Treat**



Trunk or Treat is an annual Halloween event hosted at the Castle in the Trees playground in Littleton. Local organizations set up themed trunks and kids in town come and "trunk or treat" at each car. We have attended this event for 2 years now. This year, we built a candy-dispensing Lego robot with some of our FLL team members. It was a total hit with the kids, and a great way to involve our FLL members in community outreach.

2

**LELWD Presentations**



LELWD was our team's biggest sponsor in the 2017 season, and is continuing to sponsor the team in 2018. Every fall, we go to a board meeting and update them on our team's progress and major accomplishments. These meetings are open to the public, so they are also a great way to raise awareness of FIRST and our team in the community.

2

### LPS School Committee Presentation



Since many of our members go to Littleton Public Schools, our team presents periodically at their school committee meetings. The school committee meetings are also broadcasted on Littleton Cable TV, so we reach a larger audience.

2

### Holiday Bazaar



In December for the past 2 years, we attended Littleton's Holiday Bazaar. This is a widely attended event in the community. We set up display tables with information about our team and FIRST, as well as partner with our team sponsor, iRobot, to raffle a Roomba 980.

2

### Political Leaders Meeting



At the end of the 2017 build season, we invited Congresswoman Niki Tsongas and MA State Senator Jamie Eldridge to our workspace. We showed them our robot, as well as discussed ways to get more students involved in FIRST. We have kept contact with both of them, and have been featured on their Facebook pages.

1

### Smart Home Demo



In March 2017, we attended the Nashoba Valley Smart Home Demo in Westford. By being in Westford, we were able to reach a new community, which helped recruit Westford students to our team for the 2018 season. We also partnered with Bose to raffle off a Soundlink color.

1

### Carwash & Pie-in-the-Face Fundraiser



We hosted a carwash fundraiser and pie-in-the-face event before our trip to Worlds in 2017. For the pie-in-the-face event, we had people pay money to pie people in the face, including the Littleton Selectman, Littleton Middle School Principal and the Littleton Business Association President. This event was a great way to raise money for our Worlds trip, as well as connect with leaders in town to raise awareness about our team

1

### Littleton Selectman Presentation



Before our trip to the World Championship in 2017, we presented at the Littleton Selectman's meeting. The team was awarded a certificate from the Selectman for our rapid growth and success in our first season. This relationship we formed was critical in getting our new workspace for the 2018 season.

1

### ZOLL Demo



In June 2017, we went to ZOLL Medical's campus in Chelmsford to present about our team and demo our 2017 robot for their employees. Following the presentation, our team was given a tour of their facility, and an overview of the products they make. This was a great way to connect with our sponsor and give our students an introduction to the biomedical engineering world. We plan to return this June with our 2018 robot.

1

### Littleton Rotary Presentation



Our team presented to the Littleton Rotary Club in June 2017. We updated them on our team's rookie season, and what our plans were moving forward. Following this presentation, Rotary became a sponsor of the team!

1

### Greenfest



Greenfest was a new outreach event for the 2017-2018 season. We wanted to extend our reach to the greater Boston area, so attending Greenfest in the heart of Boston was a great way to get this effort started! This was also a combined FLL-FRC outreach event. We used this event as the conclusion to our summer FLL program. The FLL members demoed the robots they built, as well as set up a water filter building station in preparation for the Hydrodynamics season. This was a very fun and engaging outreach event where we were able to reach thousands of people!

1

**Ed's Weenies Table Sitting**



Ed's Weenies is a popular hot dog stand in Littleton. We connected with the owner who invited us to set up a table in the spring, summer and fall of 2017. Similar to table sitting at Donelan's, these events are very easy to set up and are an effective way to reach out to the community. We have retained this partnership with Ed and will be returning this spring.

3

**RoboExpo**



RoboExpo, hosted by FRC 1058, was another new event this season. Similar to Greenfest, it was a combined FLL-FRC outreach event. It takes place at the Pheasant Lane Mall in Nashua, NH. We set up a Steamworks field in the center of the mall, and demoed our robots. Our FLL teams set up a Hydrodynamics field and demoed their in-progress robots as well. It was a great and engaging way for our team to reach a new community.

1

**Boston Youth Expo**



At Greenfest, we connected with some employees of Boston mayor Marty Walsh's office. They invited us to attend the Boston Youth Expo in Dorchester, MA. The goal of this event was to connect Boston students with different career and extracurricular opportunities. We attracted many students with our ball-shooting bot, and were able to connect 20 students to FIRST programs. We plan on returning next fall.

1

**Discover STEM Event**



In an effort to reach more students in the Acton-Boxborough community, we attended the Discover STEM event at Acton-Boxborough Regional High School. We were invited by our Regional Director after collaborating with him at the Boston Youth Expo. Attendees loved interacting with our 2017 robot. Following this event, we had our first AB student join the team!

1

**Total Traditional Outreach Events**

**34**

## Team Outreach Programs

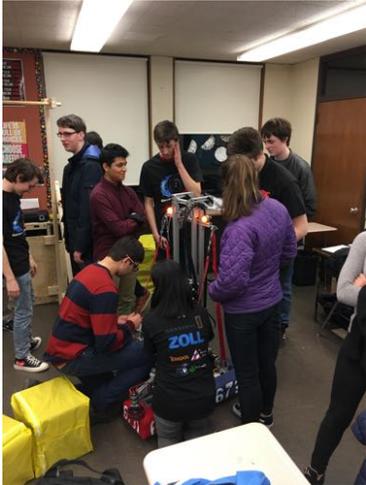
In addition to traditional outreach events, our team developed our own outreach programs. The overall goal of these events was to reach unique communities, such as the Best Buddies members at Littleton High School. A summary of our team-developed outreach events is below.

Event	Description	Frequency
<p data-bbox="248 405 651 436"><b>Girl Scouts Robotics Badges</b></p> 	<p data-bbox="797 436 1320 1205">We partnered with the Littleton Girl Scout Brownie and Junior troops to create a program for the scouts to get three robotics and programming badges. Both FRC and FLL members participated. At the first part of this program, we had 4 stations: FRC robots, FRC events, FRC team structure and FLL robots. The scouts rotated through the stations and filled out worksheets at each. We had nearly 40 scouts in attendance! At the second part of the program, our FRC and FLL members helped the girls work through the engineering design process and reviewed their robot designs, and the girls received their badges. Our team developed a “How-To” guide for setting up a similar program, so more FRC teams can do this for their local troops. We will be repeating this program with the Westford Girl Scouts and Littleton Girl Scouts.</p>	<p data-bbox="1414 806 1435 837">2</p>
<p data-bbox="297 1245 602 1276"><b>STEAM Careers Night</b></p> 	<p data-bbox="797 1245 1320 1913">Since our mentor group comes from such diverse backgrounds, we decided to host a STEAM careers night to expose students to different career fields. We had tables set up for multiple careers, including biomedical, environmental and mechanical engineering, as well as PR, social media and Information Technology. Our team members also developed career fact sheets for the event, getting them additional exposure to career opportunities in STEAM fields and showcasing how important it is to be able to understand and process technical information, even in non-technical career fields. We plan on partnering with the Girl and Boy Scouts next year to make this event even bigger and widely attended.</p>	<p data-bbox="1414 1577 1435 1608">1</p>

<p><b>Best Buddies STEM Program</b></p> 	<p>One of our team members participates in the Best Buddies program at Littleton HS, and saw that the buddies were interested in learning more about STEM, but didn't have many opportunities to do so. As a result, our team developed a STEM outreach program with the Best Buddies this fall. Our first event was Halloween-themed, and we taught them 3D-printing, and did a programming activity with the FLL robots. At our second event, we had stations for 3D printing, programming activities with the Sphero bots, as well as an activity where we conducted electricity through Play-Doh to make a Play-Doh piano. We will be inviting the buddies to our local district competitions and will develop additional events this spring and summer.</p>	<p>2</p>
<p><b>Pasta Dinner</b></p> 	<p>Every November, our team hosts a community pasta dinner. The inaugural pasta dinner was well attended, but we were able to grow it to be even larger this season. Additionally, this year we had our FLL members present about the FLL program alongside our FRC team members. Following the team presentations, our team members demoed the FLL and FRC robots. We also set up a robot-themed photo booth, which was very popular among attendees!</p>	<p>2</p>
<p><b>Team Open Houses</b></p> 	<p>Our team hosts an open house for our sponsors at the conclusion of build season each year. It is a great way to engage our sponsors and let them see what their gracious donations allow us to do. We also hosted a special open house this December to show our new workspace to the community and thank Patriot Beverages for all they have done to make our team possible.</p>	<p>3</p>
<p><b>Total Team Outreach Events</b></p>		<p><b>10</b></p>

**FRC Team Mentorship & Assistance**

Our team also assists and mentors other FRC teams. We are currently mentoring rookie FRC team 6812 out of Philips Academy in Andover, MA, and assisting second-year FRC Team 6731 out of Belmont, MA. The table below summarizes what we have done this season.

Team	Description
<p data-bbox="233 405 773 432"><b>FRC Team 6812 – Andover Snowflakes</b></p>  	<p data-bbox="829 411 1412 1276">We began mentoring FRC Team 6812 this fall. We initially met with their student leadership team, and identified their strengths, areas for growth, current resources, financial status, team size, and overall goals for the season. A few weeks later we returned with our 2017 robot and demoed it for their entire team. This allowed the team to get a better idea of how you go about building an FRC robot. We gave the members an overview of mechanical design, the FRC control system and programming FRC robots. We also invited members of the team to serve as Core Values judges at our FLL Practice Interviews Day to help the team start their community outreach program. Additionally, we recently connected the team with a technical mentor from ZOLL Medical, who will be assisting the team. With the addition of a ZOLL mentor of their team, they may also be eligible to receive ZOLL sponsorship in the future. We are currently working with ZOLL to secure funding for additional FRC teams. We are staying in contact with the team over email to assist in any way we can.</p>
<p data-bbox="263 1289 743 1352"><b>FRC Team 6731 – Belmont Record Robotics</b></p> 	<p data-bbox="829 1367 1412 1797">Our team has been assisting FRC Team 6731 with their social media and outreach as well as obtaining new sponsors. We helped them connect with ArcPoint Strategy to develop a team brand and increase their presence in the Belmont community. One major way they have done this is by sending press releases about the team to their local newspaper. We also linked them with a ZOLL employee who is now a technical mentor for the team. We were also able to assist the team with gaining ZOLL as a sponsor for the 2018 season!</p>

In addition to working directly with these teams, we have also developed a how-to guide for achieving sustainability for rookie FRC teams based on our experiences. We are working on making this widely available to FIRST teams worldwide.

### Future Outreach Events

Our team has developed plans for future outreach events and programs to continue growing this area of our team. Plans for future FLL outreach events can be found in the FLL business plan, and the rest are shown below.

Traditional Outreach Events	Team Outreach Programs	FRC Team Mentorship & Assistance
<ul style="list-style-type: none"><li>• Work with Acton Discovery Museum to build FIRST-themed display this spring/summer</li><li>• Work with regional director Steve Cremer</li><li>• Make display interactive and information for all ages</li></ul>	<ul style="list-style-type: none"><li>• Partner with local Girl and Boy Scout troops to host STEAM Careers Night next year</li><li>• Connect with Central MA Best Buddies Program Manager to expand STEM Outreach events</li><li>• Distribute how-to guide for developing Girl Scouts badge events</li></ul>	<ul style="list-style-type: none"><li>• Continue mentoring 6812 and assisting 6731</li><li>• Work with ZOLL to establish company sponsorship of all ZOLL-mentored teams</li><li>• Mentor additional rookie teams in 2019 season</li><li>• Distribute Team Sustainability guide to rookie teams</li></ul>

# Future Plans

We have plans to host an FLL Qualifier and Jr. FLL expo next season. We have already been in contact with the MA FLL director and have booked space at Russell Street School in Littleton for the FLL event. We will be forming our core group of volunteers who will assist in running this event. We are also planning on hosting a Jr. FLL expo. Our workspace is a great fit for an event like this, as it has large open spaces as well as offices. Teams could set up their displays all throughout the space. We estimate a team capacity of 50. There is a large opportunity to grow Jr. FLL in MA, as expositions are currently scarce and difficult to find. More information about these plans can be found in our FLL business plan.

We will also be partnering with the Acton Discovery Museum to build a FIRST themed-exhibit in their new building this spring. The goal is to make the exhibit interactive and engaging for all ages. We have been in contact with our Regional Director regarding this and will be working together to build the display.

We summarized additional short-term and long-term goals for our team in the action/implementation table below.

# Action/Implementation Plan

Goal	Time Frame	Action Items
Host FLL qualifier	Short-Term	Develop core group of volunteers to organize event  Reach out to potential event volunteers early to ensure adequate training  Talk to other teams that host FLL qualifiers for advice on hosting an event  Engage with other community groups to help support the event
Host Jr. FLL expo at workspace	Short-Term	Reach out to regional director about steps to take for hosting an expo  Connect with local Jr. FLL teams that may be interested in attending  Advertise event through NEFIRST
Continue to grow outreach program	Short-Term, ongoing	Distribute how-to guides for the Girl Scouts badge events to the greater FIRST community  Complete Girl Scouts badge program with Westford troops in spring and Littleton in the fall  Distribute how-to guide for FRC team sustainability to greater FIRST community

Continue to increase gender diversity on team	Short-Term, ongoing	<p>Keep developing and improving FLL-to-FRC transition program</p> <p>Have current female members reach out to other females who may be interested in joining</p> <p>Keep running Girl Scouts badge program on an annual basis</p>
Transition senior students to mentors	Short-Term, ongoing	<p>Have sessions on "how-to-mentor" at end of competition season for senior members</p> <p>Assign senior members small mentor roles during offseason and beginning of competition season</p> <p>Network with other teams near where the students will be going to college to see if there are mentorship opportunities on other teams</p>
Obtain a space to build a practice field	Long-Term	<p>Identify potential spaces where practice field could be built</p> <p>Determine funding that would be needed</p> <p>Talk to local teams with practice fields to determine how they obtained their space</p>
Build two robots	Long-Term	<p>Develop necessary technical skills</p> <p>Purchase a CNC milling machine</p> <p>Gain more skilled students and mentors</p> <p>Expand budget to include materials for second robot</p>
Gain long-term, highly skilled mentors	Long-Term	<p>Have skilled mentors continue to train new, inexperienced mentors</p> <p>Recruit new mentors to team each year</p> <p>Provide annual mentor recognition to ensure mentors feel valued</p>
Gain reputation within FIRST community	Long-Term	<p>Set achievable goals each year</p> <p>Build robot within our constraints each year – do what you are able to well!</p> <p>Continue expanding outreach program</p>

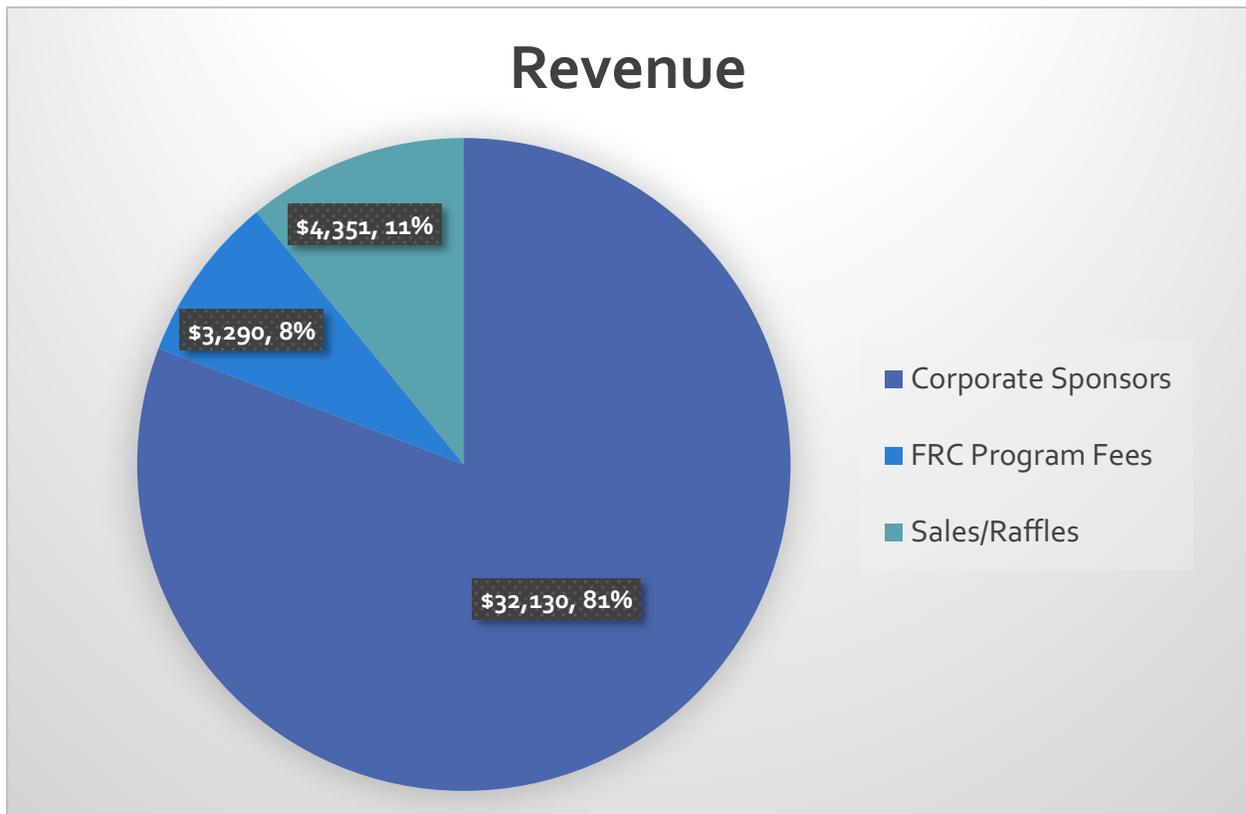
# Team Budget

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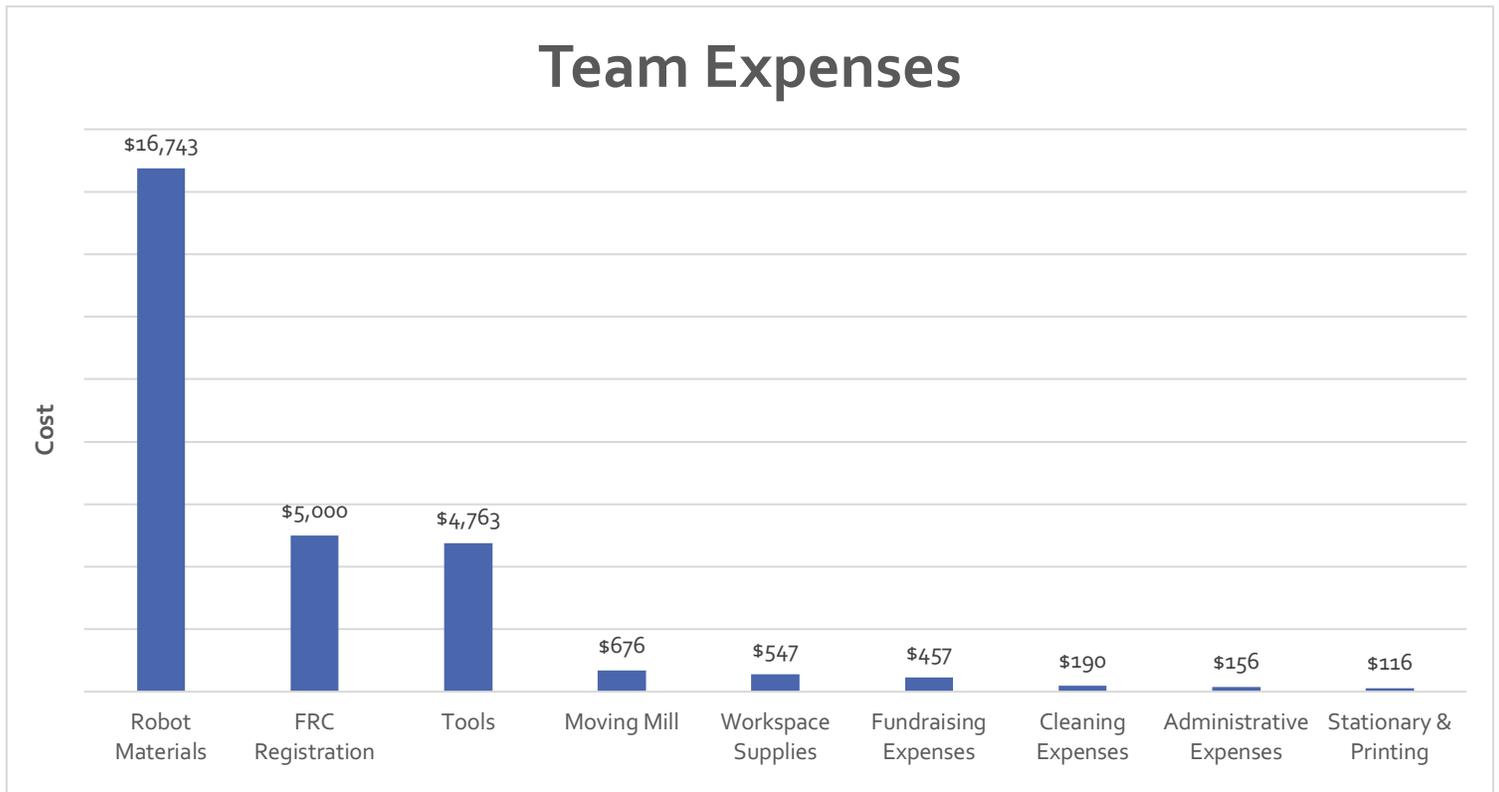
## Team Income & Expenditure

Below are graphs showing our team's revenue, main expenses to date, as well as a summary of our income and in-kind donations. Our team's finances are managed in Quick Books, and reports of income versus expenses are produced weekly throughout the build season.

Our team has 3 main sources of revenue – corporate sponsors/donations, program fees and sales/raffles. As seen below, 79% of our income comes from corporate sponsors and donations, and 21% comes from raffle sales and program fees.



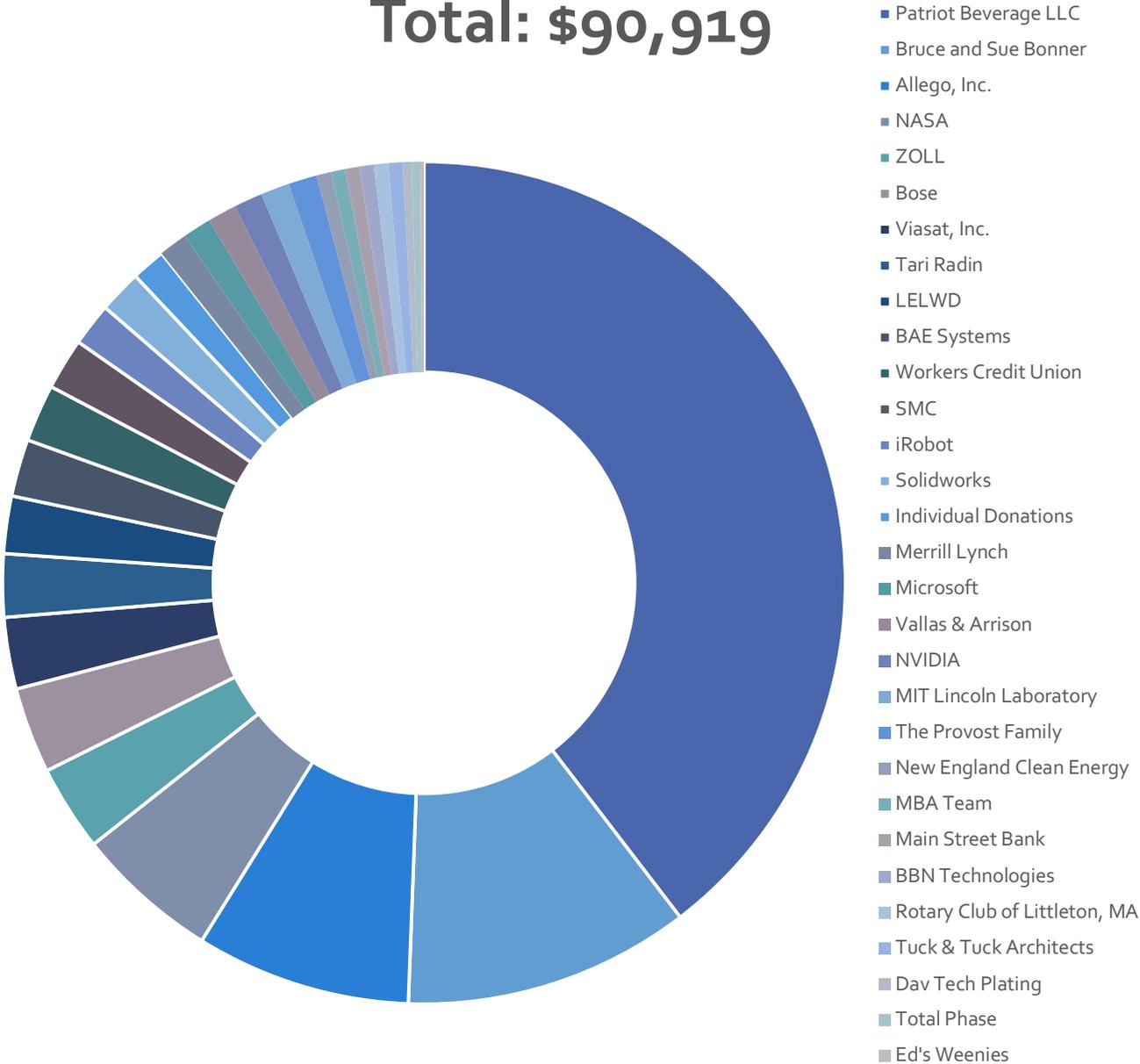
Here is a plot of our main team expenses to date. Our major expenses have been the registration fee, tools and robot materials.



We also summarized our income and values of in-kind donations. We have received many valuable in-kind donations this season, including \$7,500 of donated office furniture from Allego, Inc. We have also valued our team workspace at \$36,000, which is the largest percentage on this chart.

## Summary of Income & In-Kind Donations

# Total: \$90,919



## Additional Opportunities for Support

Below is a list of the other ways to support or team outside of monetary donations.

- Donate materials: tools, metal, fasteners, electronics.
- Fabrication services: CNC machining/bending, aluminum welding, laser cutting, 3D prototyping/printing, etc.
- Donate team uniforms, silk-screening and/or embroidery.
- Provide scholarship opportunities for graduating team members.
- Donate services, prizes, or gift certificates to use in a team raffle or fundraiser
- Supply meal(s) for the team during team functions/competitions.
- Volunteer as team mentor

Below is a table summarizing mentor roles on our team.

Role	Description
Mechanical	Assist students with robot design, CAD models, building field parts, robot assembly
Electrical	Assist students with wiring the robot, mounting electronics and specking sensors
Programming	Assist students with programming the robot
Strategy	Assist students with developing scouting system and planning match strategy
PR	Assist students with publications, updating social media accounts, team website updates, presentations, etc.
Fundraising	Assist with raising necessary funds for the team via team raffles, corporate sponsors and donations from local businesses
Community Outreach	Assist with scheduling community outreach events and developing the team's outreach strategy. Help with mentoring and running of FLL teams.
Awards	Assist students with awards submissions.

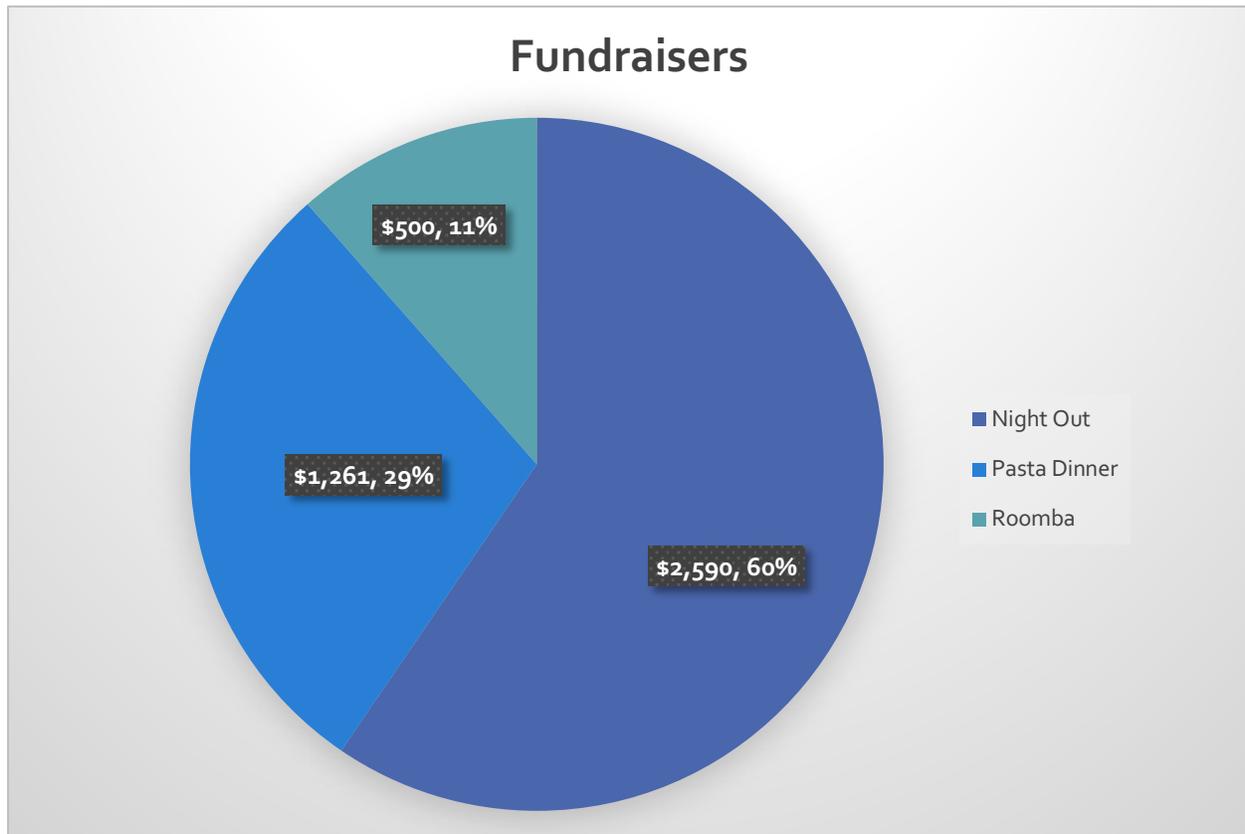
## Sponsor Benefits

Sponsorship Value	Benefits
Steel: \$100-\$499	Sponsor logo on team website
Bronze: \$500-\$1,999	<b>Steel benefits plus:</b> Business name on banner and team shirts
Silver: \$2,000-4,999	<b>Bronze benefits plus:</b> Business logo on banner and shirts, team shirt
Gold: \$5,000-\$9,999	<b>Silver benefits plus:</b> Sponsor name on robot
Platinum: \$10,000	<b>Gold benefits plus:</b> Robot demonstration at local company headquarters
Diamond: \$20,000+	<b>Platinum benefits plus:</b> Largest logo placement on robot Business name included in team name at competitions

# Team Fundraising Opportunities

## Current Team Fundraisers

Our team held 3 major fundraisers this year – Pasta Dinner, Night Out raffle and a Roomba raffle. Our team raised \$4,351 from these fundraisers, and the distribution from each is shown in the graph below.



The team pasta dinner is not intended to produce major revenue, however, many people in attendance donated money after hearing about our team from our student presenters. Tickets were sold for \$10 each prior to the event and were sold by student members on the team. The event was advertised on our team website, social media accounts, engagement with community organizations, and flyers around town.

Our Night Out raffle occurred over a five-week period and generated the most revenue for our team. We were raffling over a one-night stay at any hotel, dinner and a show. We sold tickets online as well as in person at events in Littleton, such as the Holiday Bazaar. All of our students were required to sell \$300 in tickets during the sales period.

We were also given a Roomba 980 to raffle off by iRobot. We raffled this off at the Holiday Bazaar in December and were able to raise \$500. We advertised this event on social media and flyers we posted around town.

## Future Team Fundraisers

We plan to additional fundraisers this spring if our team qualifies for the New England District Championship and/or World Championship. Our World Championship fundraisers last season were extremely successful, raising \$26,000 in a little over 2 weeks. We will extend our fundraiser reach to additional towns, such as Westford and Acton. One idea we have for extending outside of Littleton is partnering with the Chipotle in Westford. Chipotle offers organizations 50% of proceeds over the course of a day. This could be a simple and very profitable fundraiser for the team. Additionally, we plan on using a crowdfunding platform such as GoFundMe if we qualify for the World Championship. We used GoFundMe last year and raised over \$6,300 for our trip to St. Louis.

## Final Statement

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Mechanical Advantage, as a second-year team, is rising as a leader in the New England FIRST community. We have had substantial influence on our community and have a driving vision to continue growth in community engagement and support. We seek to exemplify the FIRST Values of Gracious Professionalism and Coopertition and be a role model for FIRST and the communities where we live. Our students and mentors understand the critical need for collaborative success to keep our team's major stakeholders engaged and invested, and to show them how important it is for students to have access to FIRST and all the educational opportunities FIRST provides. This is the driving force behind the acute attention to detail in all parts of our team, and the mutual understanding that settling for good solutions will prevent us from finding the great ones.

# Team Contact Information

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## General Contact Information

Website: [littletonrobotics.org](http://littletonrobotics.org)

Team Email: [info@littletonrobotics.org](mailto:info@littletonrobotics.org)

Facebook: <https://www.facebook.com/mechanical.advantage.littleton/>

Twitter Handle: FRC6328

Instagram Handle: FRC6328

## Main Contacts

Mentor Name: Deanna Clark

Title: Team Manager

Email: [info@littletonrobotics.org](mailto:info@littletonrobotics.org)

## Team Meeting Information

Location: Littleton Robotics World HQ - 20 Harvard Road, Littleton, MA 01460

Times: M-F 5-9, Sa 9-5, Su 12-5

## Sponsorship Information

Checks should be payable to: Littleton Robotics or use the Paypal button on our team website

Donations are tax-deductible (Tax ID number 81-3261821)

## Mailing Address

Littleton Robotics

PO Box 291

Littleton, MA 01460