

Trumansburg Robotics
FRC Team 5254 HYPE
Competition Year 2017-18

TCSD Foundation
Grant Request



Trumansburg High School
Trumansburg, NY

www.frc5254.com
roy@trumansburgrobotics.org

Version 1.2 10.30.17



Trumansburg Robotics
FRC Team 5254 HYPE
www.frc5254.com

November 30, 2017

Dear TCSD Foundation Grant Committee,

I'm writing to you on behalf of the Trumansburg High School Robotics Team to thank you for your organizations generous support of FRC Team 5254 HYPE (**H**elping **Y**outh **P**ursue **E**xcellence), to provide an update on our teams progress and plans for the future, and to submit a grant request of \$1,500 to acquire a 3D Printer that will significantly expand our teams design options and fabrication capacity.

Your organizations generous support in the past has proven to be the catalyst for many of the seminal accomplishments for our program. And it is anticipated that this grant request will provide the tool need for our next evolution in technical development, for our next seminal moment.

In our first year, the TCSD Foundation provided funds for us to build our very first training robot. This training robot proved to be the foundation of the training program that we use to expand the knowledge of our continuing members and to assimilate new members each year. The addition of designing and building a training robot to our development program proved to be one of the key training resources that helped our team soar to new heights, as in only our second season we finished as finalists in both of our regional competitions and qualified for the World Championships.

In our third year, the TCSD Foundation provided funds for us to purchase a second electronics control system - the first set always goes on the primary competition robot. We were able to use this second control system set as both a training platform in the off-season and as the control system for a practice robot during competition season. Having this second electronics control system, and being able to utilize it in a multiple capacities, allowed us to expand our training program further to develop more students in the purpose, operation, and wiring of the control system; as well as develop a new training program to teach students how to program the robot in Java. This also propelled us to a new level as in our third season we won the Engineering Excellence award at our regional competition; and also qualified for the World Championships finishing as finalists in our division.

As we enter our 5th season, the next evolutionary step in our team's development is centered on our ability to expand our design and fabrication capabilities. We are poised to move beyond our simple chop saw and drill press tools using off the shelf parts and to expand into custom fabrication. To help us take our first step into this expansion we are requesting \$1,500 to acquire a 3D Printer.

With our sincere thanks,

Roy Westwater

Roy Westwater, Mentor & Founder
Trumansburg Robotics
FRC Team 5254 HYPE



GRANT APPLICATION FORM

Name: Roy Westwater
Trumansburg Robotics
FRC Team 5254 HYPE
Email: roy@trumansburgrobotics.org
Phone: 607-279-1454
School: Charles O Dickerson High School
Position: Robotics Mentor, Program Founder
Project Title: 3D Printer To Expand Fabrication Capacity

Primary Project Objective:

As we enter our 5th season, the next evolutionary step in our team's technical development is focused on expanding our robot design options and fabrication capabilities.

Through a comprehensive off-season training program we have further developed our understanding of and discipline in the execution of the overall engineering design process; expanded our knowledge of mechanical engineering as it relates to building FRC robots; and have greatly expanded our overall design and CAD skills.

Having reached this next level of design and development, we are poised to move beyond our simple chop saw and drill press tools and using off the shelf parts, to expand our capacity and capabilities into the design and fabrication of custom components.

Our first step in this expansion is to be able to utilize our CAD skills to design new custom parts and to then fabricate them on a 3D Printer. We have developed the design and CAD skills; we need new tools to assist in the fabrication. To support this opportunity, we are requesting \$1,500 to acquire a 3D Printer and materials.

Grade Levels and Number of Students to Benefit:

FRC Team 5254 HYPE (Helping Youth Pursue Excellence) consists of high school level students from the 9th - 12th grade. At the moment, as we are still actively recruiting, our robotics team has 21 team members - 12 are non-freshman and of those 5 are female.

While our FRC program plays a critical role in expanding the STEM programs available to the high school students in our district - in our robotics program every high school student can actively participate and benefit, even those who may not be partial to science, math, or technology. In our robotics program, there are critical roles for students in everything from robot design and build, to computer programming, web design and digital media, as well as business planning, fundraising, research, and community outreach. There is a role for everyone. To support this we have developed a comprehensive training program so that no specific skills are needed to join the program - only the desire to be part of a team.

In addition our team provides opportunities for all members. Our team values respect and opportunity among all students and enables those with desire, commitment, and effort to elevate to meaningful leadership positions within our team. We live and practice the belief that the equations we use for the evaluation of what are good ideas, designs, code, or project plans is exclusive of race or gender.

Our teams students and mentors have established diversity, and more specifically gender equality - given our demographics, to be a core part of our ideals and beliefs. As an example, for one of our off-season training robot builds we had a female in charge of the electronics, another female in charge of designing and fabrication of the gear mechanism, a female in charge of designing and fabrication of the climbing mechanism, and a female as CAD lead and project coordinator for the overall build.

In our commitment to gender diversity, this off-season, we have made a concerted effort to establish relationships and coordinate with Cornell University's Women in Computing and Society of Women Engineers programs. While these relationships are new we expect them to serve as the conduit to developing enriching leadership and mentoring programs not only in support of all members of our team, but also within the school and community. As an example we are beginning a Middle School outreach program to engage students, and their parents, interested in STEM to participate in the Cornell University's Women in Computing workshops in the winter and spring.

How will grant funds be used to support the project objectives?

As mentioned, the next evolutionary step in our team's technical development is focused on expanding our robot design options and fabrication capabilities. Acquiring a 3D Printer is the first step to support these efforts.

This new fabrication tool will be used throughout our training program and competition build seasons for this year and many years going forward.

How will you measure success of the project?

Our success will be measured by frequency in which students are actively designing, and fabricating robot parts on the 3D printer. We expect the impact to be immediate and that the value of having a tool like this will continue to increase each year as we get more experience with custom fabrication.

Funding Needed for Implementation:

Provided by TCSD Foundation:

\$1,500 to acquire a 3D Printer and printing materials

Details on the specific components requested are outlined in *Appendix A – 3D Printer and Materials*.

Provided by Other Sources:

Our FRC program budget is \$31,000 for the 2017-18 season (\$50,000 if we make it to the World Championships). We are actively pursuing sponsorship funds from regional and

local businesses. We have established and are expanding our business sponsorship and community fundraising programs to fund our robotics programs operating costs.

Details on our overall program budget are outlined in *Appendix B – Team Budget Detail 2017-18 Season*.

Detailed Budget:

Please see the included *Appendix B – Team Budget Detail 2017-18 Season* for details on the team’s expected expenses and revenues.

Time Schedule for Project/Item:

While our primary build and competition season is from January through April our program operates all year round, 12 months a year, with extensive pre-season and post-season activities.

Build and Competition Season:	January through April
Post-Season Review and Planning:	May through June
Pre-Season Technical Training and Planning:	June through December

The funds requested for this grant will be used to support the team during the entire year, and for years going forward.

If your project is not fully or partially funded by TCSD Foundation, do you anticipate completing the project, and, if so, how?

Our programs commitment and engagement to STEM education is growing each year. We manage the program pragmatically with the resources that are available. The team’s advisors remain confident that they will raise the needed funds and are working aggressively to raise these funds. At the same time, if a more modest amount is raised through this TCSD Foundation grant, other grants, sponsorships and fundraisers the team and its advisors expect to be able to scale back but still be able to participate in the 2017-18 season.

Applicant Signature: Roy Westwater Date: November 30, 2016

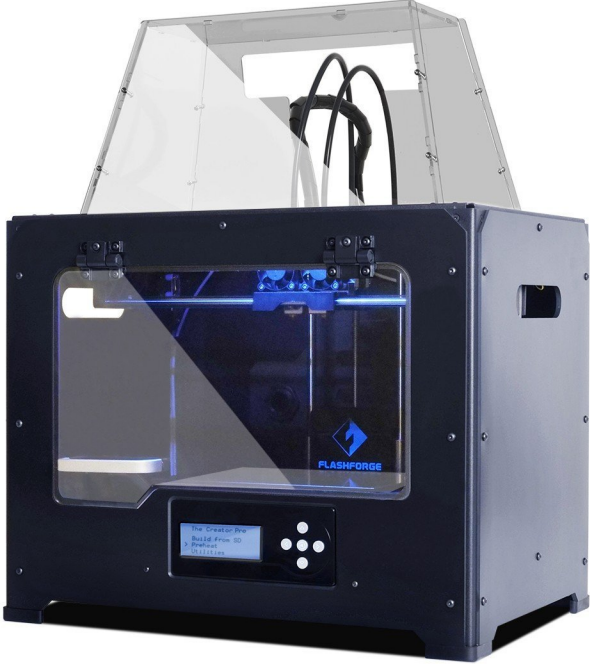

Applications accepted from Trumansburg Central School District and local 501(c)3 organizations. Mail or email completed form and any supporting documents to: Katherine Walker / 19 Congress St. / Trumansburg, NY 14886 / katherinewalker@gmail.com



APPENDIX A – 3D Printer and print materials

TCSD Foundation Grant Request Bill of Materials

Our team is requesting \$1,500 from the TCSD Foundation to a 3D Printer and print materials.

	
<p>FlashForge 3D Creator Pro</p> <ul style="list-style-type: none"> • Dual Extruder (can print 2 types of materials at a time) • Open Source components • Open Source software • Prints ABS, PLA, HIPS, and PVA 	<p>Filament</p>

Components of FRC 3D Printer and Materials

Product	Unit Price	Quantity	Total
FlashForge 3D Creator Pro	\$1,300.00	1	\$1,300.00
Filament (various types)	\$25.00	8	\$200.00



APPENDIX B – Team Budget Detail 2017-18 Season

Expected Expenses

The following is a summary of our 2017-18 expected expenses.

	2017-18
Competitions	Expected
Off-Season Event (Rochester)	\$1,000
Off-Season Event (Albany)	\$1,000
Regional Event #1 Registration	\$5,000
Regional Event #1 Food & Lodging	\$4,000
Regional Event #2 Registration	\$4,000
Regional Event #2 Food & Lodging	\$4,000
Total	\$19,000
Robot Build	Expected
Robot Parts	\$7,500
Game Field Construction & Materials	\$500
Tools and Supplies	\$2,000
Total	\$10,000
Team Development	Expected
Operations	\$1,000
Total	\$1,000
Promotional Materials	Expected
Team Banner	\$200
T-Shirts and Promotional Items	\$800
Total	\$1,000
Total Expenses (through Regionals)	\$31,000
World Championships	\$19,000
Total Expenses (through Champs)	\$50,000