

To: Education Foundation of Indian River County Date: November 2, 2017
c/o Cynthia Falardeau

From: William Wallace

Name of Project: Competitive Robotics Teams (school-based)

Additional Information about the Project

We are starting our inaugural year of the Competitive Robotics Club at Sebastian River High school. The club members are the core of team(s) that will eventually compete with other teams throughout Florida and the United States.

This project and the requested funds will provide the club with the necessary design, construction, maintenance and control equipment, materials, tools and competition kit needed to collaborate on a competitive entry into the Robotics Education & Competition (REC) Foundation sponsored competition.

Amount Requested: \$7,350.00

Targeted Population

This project is targeted at students (teams of 3 – 5 students) who have a desire to pursue careers in electronics, robotics and/or engineering in addition to challenging their analytical, strategy and problem-solving skills.

- **Number of children to be served and grade level(s)**
Two teams of 3 to 5 students for a total of up to **10 students**.

Succinct Summary

- **The Issue, the change, and the action:**
There isn't any curriculum that addresses the real-world challenges of designing, constructing, testing and implementing engineering solutions. This project affords two teams of students the opportunity to learn collaborative design, converting the design into a product and then using the product to address the problem/challenge for which it was designed. The hope would be that eventually project-based curriculum could be

integrated into a cross-subject group of the core courses in science and math. For example, in my Physics course, I'm hoping (next year) to begin using robotics to demonstrate and provide hands-on inquiry into Physics concepts. This purchase can also be used in support of classroom activities.

- **The Issue: What challenge or opportunity will this grant help your school address?**

As the teams become active in competition, the hope is that by publicizing the teams' competitive activities STEM education will become "sexier" in the minds of students who keep asking "why do I need to study this?" And, just as band, drama, art and ROTC programs promote musical, creative and military careers, showing students the excitement of designing and building their design they will become excited about careers in engineering, programming, robotics and other STEM careers.

The Change:

- **What change do you intend to see as a result of this grant?**
This is a longer-term project in terms of impact. However, immediately, it provides students the ability to explore robotics, electronics and general engineering to see if it is what they'd like to pursue after high school. The longer-term impact would be increasing student interest in STEM careers – especially engineering, automation, programming.

The Action:

- **What strategic activities will be included in this grant (what are the steps)?**
This grant will fund the formation of two teams for the robotics competition this year and the majority of the funds needed through next year. Once formed, the teams will begin the process of developing strategies for succeeding in competition, developing designs to support the strategies and then building the robots according to their designs.

Going forward, the teams will evolve as the membership expands and this year's underclassmen mature and become more capable in

succeeding years. Potentially, more teams can be formed allowing for in school competition as well as regional competitions.

Grant Oversight:

- **Who will be responsible for the project?**
William (Bill) Wallace (Physics teacher, SRHS)
- **Who provides the oversight?**
William Wallace and a yet to be named co-mentor.
- **Who will insure that the project is sustainable?**
William Wallace and a yet to be named co-mentor.

Monitoring Progress and Results:

- **How will progress and results will be monitored and reported?**
The purchases will be concluded almost immediately after funding (except for travel). Results will take two forms: interim milestones in the design, build, test process for the competitive robot; success in competition. The unknown is the timing of funding relative to the competition scheduling for this year. We may need to use this year as a training period and getting prepared for developing the solution to next year's challenge (which starts in the spring).

Itemized Budget:

- **Provide a line by line, itemized budget of all items needed for the project, including cost. (next page)**

| Expenditure Item | Rationale | Price Each | Number | Total |
|--|--|------------|--|-----------|
| Laptop Computer | Needed to design the robots, program the robots AND maintain club and competition documents | \$1000.00 | 2 (2 teams AND for backup/redundancy during competition) | \$2000.00 |
| Robot Competition Build Kit | This kit includes most of the approved materials, supplies and building components required to build a sanctioned and competitive robot. | \$1200.00 | 2 (2 teams) | \$2400.00 |
| Robotics Competition Challenge Kit | This allows the teams to test and improve their Robotic design and competition strategies . One kit can be shared between the 2 teams. | \$1600.00 | 1 | \$1600.00 |
| Robotics Design and Programming software | This is required to program the Robot “brain” and to design the structure of the robot to meet the competition challenges | \$500.00 | 1 - 6 seat permanent license to Robot C 1 – to be selected design | \$500.00 |

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|--|---|----------|--|-------------------|
| | | | software | |
| Travel to Competitions (van transportation) | This expenditure is only an estimate as it depends on the number of competition entered and the success of the team in advancing in competition. | \$500.00 | 4 events @ \$125 per event (truly unknown at this point) | \$500.00 |
| Miscellaneous equipment, materials and supplies impossible to estimate at this time. | As the team refines their designs after testing new equipment, materials, etc. beyond the original kit will undoubtedly be discovered | \$200.00 | 1 | \$200.00 |
| Tool Kit | The teams will need tool kits for constructing and repairing their robots. In addition to having the tool kit at school during construction, they will also need to have one kit for each team at competition for repairs and adjustments during competition. | \$75.00 | 2 | \$150.00 |
| TOTALS | | | | \$7,350.00 |

In hopes that this Project Idea is accepted and funded.

Respectfully,

William Wallace

Physics Teacher

Sebastian River High School

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