Please read through the full application so you are prepared to submit a complete submission. The following items must be uploaded; itemized project budget, sign-off sheet (this can be downloaded from this application, completed and then uploaded for final submission).

Name Of Applicant(s) *

Andrea Mangold

Main Applicant's E-mail Address *

amangold@crsd.org

Main Applicant's Cell Phone Number *

2159837309

Daytime Telephone Number *

2159837309

Originating School/Organization *

Holland Elementary School

Name of Project *

"STEAM Rolling with Sphero

Project Description – Please provide a brief overview, in 50 words or less. *

This grant seeks funding for a classroom set of Sphero programmable interactive robotic devices (https://www.sphero.com/education/). A classroom set of 15 lends itself to partner groups for classrooms up to 30 students. The main objective of this grant is to use the Sphero robotic devices as a platform to integrate programming and technology with many of the instructional content areas of the Council Rock K-6 program.

Amount Requested *

$2649.99

Where will the project take place? Please select all that apply. *

- [ ] Council Rock North
- [ ] Council Rock South
- [ ] Holland Middle School
- [ ] Newtown Middle School
- [ ] Richboro Middle School
- [ ] Churchville ES
- [ ] Goodnoe ES
- [ ] Hillcrest ES
- [x] Holland ES
- [ ] MMW ES
- [ ] Newtown ES
- [ ] Richboro ES
- [ ] Rolling Hills ES
- [ ] Sol Feinstone ES
- [ ] Wrightstown ES
- [ ] Sloan School
- [ ] Sloan/Achieve
- [ ] Other: .....

Curricular Area - check all that apply *

- [ ] Literacy
- [x] Science
- [x] Technology
- [x] Engineering
- [x] Arts & Music
- [x] Mathematics
- [ ] Other

What are the project's objectives? *

This grant seeks funding for a classroom set of Sphero programmable interactive robotic devices (https://www.sphero.com/education/). A classroom set of 15 lends itself to partner groups for classrooms up to 30 students. The main objective of this grant is to use the Sphero robotic devices as a platform to integrate programming and technology with many of the instructional content areas of the Council Rock K-6 program.
The objective of this project is multifaceted. The key components are:
1. Support exploration of the crosscutting concepts that link different domains of science with other curricular areas;
2. Promote logical thinking in students and encourage them to develop skills in the "decomposition" of problems into smaller, manageable tasks;
3. Offer an interactive, engaging instructional platform for technology integration in Math (measurement, traditional computational algorithms), Science (coding, sequencing, hypothesizing, problem solving), Engineering (solving hypothetical problems, creating and solving situational challenges), and other curricular areas;
4. Promote literacy in the digital age;
5. Support the district 2019-2023 Council Rock Strategic Plan, Action Step 3B to "Enhance district-wide STEAM to provide all students with access to STEAM" experiences (excerpted below);
6. To offer an instructional experience that is aligned with Pennsylvania's Science and Technology standards (excerpted below).

2019-2023 Council Rock Strategic Plan, Action Plan 3B:
"Enhance K-12 district-wide curricular and extracurricular STEAM programming ▪ Develop and implement integrated STEAM instructional units which focus on teaching STEAM concepts and skills to all students at the elementary and middle levels ▪ Provide professional development in STEAM concepts (e.g., design thinking, creatively, critical thinking, communication, collaboration), inclusive of ongoing technology integration."

2020 Pennsylvania Academic Standards for Science and Technology:
"Technology education involves a broad spectrum of knowledge and activities. Effective technology education combines knowledge of content, process and skills to provide students with a holistic approach to learning. Technology education offers unique opportunities to apply numerous academic concepts through practical, hands-on applications. Instructional technology, on the other hand, deals specifically with use of computers and different software to solve problems and communicate effectively".

Why is this project considered innovative? What components make it unique? *

This project is innovative in that Sphero learning gives teachers and students another dimension of learning. By programming Sphero to solve a problem, bring an idea to life, or add dimension to a lesson, students are able to learn at the leading edge of classroom integrative technology.

Sphero devices support a variety of curricular connections, and permit teachers to give groups of students the opportunity to work simultaneously. Sphero use Javascript block coding to create a stream of directives for the device to follow. By presenting problems and situations, teachers can activate a variety of different skill sets that students can use to program the Sphero.

Thinking in programming terms gives students a foundation of critical thinking, especially in the domain of coding, interpreting data, and applying programming concepts to problem solving. That is, when a child understands how a computer works, they can transfer their knowledge to creating new programs, understanding more complex programs, and using what they know to solve problems in programs. To further illustrate, according to Trilogy Education Services (https://www.trilogyed.com/), there were 1.3 million software jobs open in the US in 2017, and in the future there will be millions more tech jobs than applicants who can fill them. One can see how a basic understanding of programming is an essential 21st century job skill.

A good example of the Sphero in action is using the device to reinforce instruction in the metric system. Metric conversions and measurement are an essential skill for 21st century learning. Sphero programming can be used to challenge students to work out metric conversions, estimate, make conversions from standard measurements to metric, etc.
Another example is allowing students the ability to solve a problem within parameters: get the Sphero to move in a given direction up an incline plane. A challenge would be the introduction of increasing degrees of incline on the plane. Students would need to test and decide at what degree the force of gravity overcomes the mass of the Sphero, making an uphill climb impossible.

Why is this project important for Council Rock students? Which students will be impacted? Describe how they will benefit. (please quantify) *

STUDENTS
Like students nationwide, Council Rock students must be prepared to face an increasingly competitive educational and employment environment once they graduate from our school district. In order to prepare our students in the best possible manner, they should have opportunities to learn in a variety of ways. By so doing, we are equipping our student with the agility and flexibility of mind that will enable them to succeed in a multitude of environments and on a variety of platforms.

Using Sphero technology in the classroom combines the fun of creating with the practice and refinement of technical skills. Specifically, this project is important because it will give students direct experience with:

- Digital skill building
- Analytical thinking (solving "if-then" problems, variables, conditions, geometry, strategy building, movement, direction, speed, estimation, measurement conversions, sequential learning)
- Patterns, cause and effect
- Scale and proportion
- Structure and function of systems
- Problem identification and solving
- Structural thinking
- Systems thinking
- Social learning

This project also supports a variety of curricular entry points; for example, Social Studies applications would include tracking the route of Magellan as he circumnavigated the globe (Gr.5 Social Studies). Math applications include sequencing, measurement, conversion, estimating, standard arithmetic algorithm skill building). Technology aspects include exposure to block coding, collaboration, and elements of the Engineering Design Processes. Sphero also comes with a protective cover that allows it to be used in Art (abstract painting, creating shapes and forms with programmed movements).

TEACHERS
Sphero offers web support and online training and resources for teachers. Sphero.edu supports a learning community of shared lessons and activities, and resources for students and teachers to use to create lessons, adapt challenges, get feedback and recommendations.

Teachers can use the Google Classroom to assign Sphero Edu content to a Google assignment or give students a choice of Sphero Edu activities that satisfy a requirement.

If applicable, please list participating staff members and or other supportive partners/entities/resources that will make the project successful. *

These devices can be shared across grade levels and educational settings in Holland Elementary School.

What assessment tool will be used to determine the success of the project? *

Authentic opportunities to assess student learning vary according to the instructional objective. Sphero can be used for formative, summative, and performance assessments in any curricular area. For example, using Sphero as a summative assessment would indicate student's ability to follow directions, or their ability to complete a challenge that required conversion of measurements. Sphero can be integrated into many of the existing curricular assessments, and can be adapted for differently-abled learners.

Provide an example about how the project will work with students. (optional)

MATH: "SPHERO GOES TO SCHOOL": In this lesson, students use Sphero to plan a route that is a model of the student's actual travel path to school. Built into this lesson are measurement criteria, such as distance, number of turns, inclines, elapsed time, etc. As student write the program, they are analyzing the problem posed by the teacher (such as, how many turns does Sphero need to make in order to arrive in X minutes to Z destination?). Sphero can also be used in scale modeling; each Sphero revolution can be made equivalent to a unit of measurement being studied (i.e., in Gr. 5, make one revolution of the Sphero equivalent to 5 meter).

Students then can use estimation skills to determine the distance from Point A to Point B by coding the revolutions and doing the conversion mathematically. The extension of Sphero into the STEAM subjects is natural; Sphero offers students an integration of Math, Technology and Science by engaging students to build skills in those areas, among others.

Finally, and of significance, is the opportunity for collaboration Sphero provides students. Social learning, especially in the formative years, is an essential element for students to build long-lasting knowledge. By experiencing social learning (that is, working with a partner to solve a problem, analyzing potential solutions, understanding different perspectives, being open to hearing the ideas of others), skill building and experience become embedded in personal, authentic learning.

Anticipated Timetable *

- [ ] Fall of 2020
- [x] Full academic school year 2020-2021
- [ ] Spring of 2021
- [ ] Other

Itemized Project Budget - please upload *

SPHERO Mangol...

Signatures of Support

Signatures - please save this image, complete then upload below

2020 Grant Application Signature Form

Deadline March 9, 2020

Name of Applicant(s):

Main Applicant's E-mail Address:

Main Applicant's Cell #:

Originating School/Organization:

Daytime Telephone Number:

Name of Project:

_____ _____

Applicant's signature **Administrator's signature (REQUIRED)**

_____

District Curriculum Coordinator's Signature

_____

Date

If more than one building is involved, each building administrator must sign application. All grants must have signatures of requestor's building administrator and curriculum coordinator.

2020 Grant Application – Council Rock Education Foundation

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Can this grant be replicated for another school?

- (●) Yes
- ( ) No
- ( ) Maybe

Terms of Acceptance of Funds

Upon grant approval, applicant will be asked to submit periodic updates, provide photographs/video/written information of the implementation of the program as described in your application, and share your project completion information and assessment of project success at a quarterly CREF board meeting.

Grant funds will be disbursed in the next fiscal year - after July 1 for the next academic calendar year. A grant number will be provided to you for processing expenditures.

All grant applicants agree to submit a completed GRANT SUMMARY REPORT before June 30, 2020. If awarded, this template will be provided to you.

Funded applicants must identify the Council Rock Education Foundation as the funding source in all written/spoken discussions and in displays of work related to the funded project.

If awarded, I agree to the terms of acceptance of funds. *

- [x] Yes. I will comply with the terms of acceptance.

Council Rock Education Foundation Innovative Grant Application 2020

Thank you for your interest in a Council Rock Education Foundation Innovative Grant award.

Since 2007, the Council Rock Education Foundation has awarded over $300,000 in support of innovative grants to teachers and schools throughout the Council Rock School District. As a nonprofit organization, our mission is to support innovative projects over and above the annual school budget that help educators like you to implement creative ideas that engage, educate and inspire our children.

Before completing the online application, please take time to read through the questions, so you are prepared to complete a full application. Incomplete applications will not be accepted. When filling out the online application, the information will be saved save as you go. You may make edits before clicking on the final submission button.

Remember, the deadline is March 9, 2020, and we accept request up to $6,000 for classroom(s) grants and$10,000 for districtwide impact grants. Please feel free to leverage additional resources for larger requests.

If you have any questions, please contact Gail Acosta at gacosta@creducationfoundation.org or 215-944-1023.

Criteria for Evaluation

These criteria will be used by CREF to evaluate each grant application. Please keep these in mind as you develop a grant proposal and complete your application.

Note: If this grant has been funded by CREF within the past three years, how is it unique to your school/why should CREF fund this grant again?

a. Is the application incomplete?

b. Is the program/proposal innovative & unique in that it is new and different? Does it bring learning to life in an engaging and exciting way?

c. Is this a new program or idea being introduced in our district classrooms? Or has a similar program already been implemented in other schools in the district?

d. Is this a student-centered program/proposal? How many students will participate/are affected?

e. Is there a continued use or benefit beyond the project/program duration (e.g. art murals, pilot programs, etc.)?

Application

CREF Grant Application
"STEAM" ROLLING with SPHERO
March 3, 2020
ITEMIZED BUDGET

Submitted by: Andrea Mangold

Holland Elementary School

Sphero BOLT Power Pack

$2,649.99

FREE STANDARD SHIPPING ON ORDERS OVER $25. US ONLY

Plug in. Power up. Roll out. The BOLT Power Pack lets you charge, store, and carry Sphero BOLT robots... times 15. Built with an integrated cooling system, your robots can charge safely all from one place.

The BOLT Power Pack is the top of the line kit for educators using the Sphero Edu program in a classroom, robotics club, or in any maker environment you can dream up. Plus it's loaded with Turbo Covers, Maze Tape, and Protractors, so the activities can get started anytime, anywhere. Tote it all like a boss in a sleek airline compliant carrying case on rollers with a retractable handle. You'll ocially be the best teacher ever

What's in the box:

Power Pack case
15x Sphero BOLT Robots
15x Inductive Charging Cradles with USB cables
15x Protractors with heading, directions, and clock
15x Clear Turbo Covers
15x Maze Tape Rolls
124x Stickers
Quick Start Guide to get you rolling
Sphero Edu app available for download on iOS, Android, Kindle, Mac, Windows, and Chrome
Sphero Play app available for download on iOS and Android
Swift Playgrounds app available for download on iOS. Works with the Sphero Arcade and Sphero Template playgrounds