INSTRUCTIONAL TECHNOLOGY GRANT PROPOSAL

Name of Applicant: Lilly Hanna

District/School: Cobb County School District/Brumby Elementary School

Date: April 8, 2029

Total Cost of Project: $1,144.00

Title of Project: SeaPerch

To what organization will you submit this grant application in the future?: SeaPerch

I. Why is this project important (In 2-3 paragraphs, describe the need for the project and its relevance to the shared vision for instructional technology)?

This project is important because Brumby is a Title I school that has within the last five years received a Cobb County STEM certification and an Advanced ED Certification. The majority of our Title I funds are spent on programs to remediate and reteach students that are preforming below grade level. The SeaPerch program will work with the other end of the spectrum and enrich and extend the knowledge of students while giving them hands experience and real-world authentic learning.

Our school serves several highly under-represented groups in the STEM field. The school's STEM outreach to underrepresented groups extends beyond conventions of race, gender, and socioeconomic status to include students with other challenges such as: Students with Disabilities (SWD), students who qualify for Early Intervention Program (EIP), and students' whose primary language is not English (ELL).

Brumby's shared technology vision is preparing digital age learners for success in a global ever-changing society. This also aligns with the goals of the SeaPerch program presenting technical career possibilities to girls, minorities, and underrepresented populations. According to SeaPerch (2013);

> "The world is changing. Innovations transform our nation, creating whole new industries and occupations. Every job of the future will require a basic understanding of math and science. Science and technology careers exist in a culture of inspiration, discovery, and innovation. Advances in technology will have a meaningful impact on the lives of every American."

II. What would you like to accomplish (In 2-3 paragraphs, describe the project and list instructional objectives/project outcomes.)?

The project is called SeaPerch. Students are given material and directions to build an underwater remotely operated vehicle (ROV). Once the ROV is built students build a challenge course to maneuver the ROV through. Through the SeaPerch program "the goal is to engage and inspire young

people by exposing them to exciting, hands-on, and mentor-based programs that build science, engineering and technology skills, while at the same time fostering self-confidence and life skills" (SeaPerch, 2013).

Our goals and objectives:

Introduce students to STEM careers.
Introduce students to Navy careers.
Give students the opportunity to learn hands on.
Build leadership skills.
Collaborate with students in middle and high school.
Work with high school NJROTC.
Invite community members to get involved with local school.
Invite community members to share real world skills with students.
Exposes students to real world problems and critically think of ways to solve them.
Provide opportunities for students collaborate, create, critically think, and communicate.
Students will understand that core technologies are the basic systems integrated to create systems and products.
Students will define quality control.
Students will identify at which point during SeaPerch construction quality control will need to be performed.
Students will be able to explain the nine core technologies.
ISTE Standards for Students:

1. Empowered Learner
   c. Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
   d. Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.
2. Digital Citizen
   b. Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.
3. Knowledge Constructor
   c. Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
   d. Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions
4. Innovative Designer
   a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
   b. Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
   c. Students develop, test and refine prototypes as part of a cyclical design process.
   d. Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
5. Computational Thinker
   b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

6. Creative Communicator

a. Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

b. Students create original works or responsibly repurpose or remix digital resources into new creations.

c. Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

d. Students publish or present content that customizes the message and medium for their intended audiences.

7. Global Collaborator

a. Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

b. Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.

c. Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

d. Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.

PS3.A: Definitions of Energy
PS4.B: Electromagnetic Radiation
PS4.C: Information Technologies and Instrumentation
ESS3.A: Natural Resources

III. In what ways is this project an example of exemplary technology integration (In 2-3 paragraphs discuss your project regarding one or more of the following: LoTi, SAMR, TPACK, TIM, etc.)?

Using the LoTi Framework model this project would fall in a level 4-6. Classroom instruction supports learning aligned to standards. There is evidence of content-related higher order thinking by students. The learning is real-world applied learning and there is two-way collaboration with experts outside the classroom (https://www.loticonnection.com/loti-framework).

IV. How will you complete the work? (Describe how the project will be completed.)

A. Describe how the instructional objectives/project outcomes will be met (2-3 paragraphs).

Students will research ROVs and use research to choose the design of their ROV. Students will then use technology to create a model or sketch a model of their SeaPerch. Throughout the process students will use innovative design to generate ideas to demonstrate process knowledge.

Students will create an engineering notebook. The notebook will include what they know before each activity and then a description of what they learned and know after completing each session. Students will be able to be creative communicators as they choose how to show transfer of knowledge.

To make connections to real-world applications and global connections students will research or critically think of ways a SeaPerch could be used. For example, the rescue mission of the soccer team from the flooded cave in Thailand. Determine the depth and width of an oil spill, or help find planes or ships lost at sea.

B. Describe the time involved (project length including amount of time each day/week; include a timeline for planning and implementation).

Our program will be a two part program. We will announce the club giving all students the ability to participate maxing out at 30-35 students. The first phase of the club will begin with six of interested members being chosen for a pilot group. The pilot group, teacher facilitator and the community champion will work together to learn and master the SeaPerch challenge. Once the pilot group has finished building a SeaPerch they will become the experts who will teach the other club members. The pilot team will be responsible for giving a demonstration to other elementary schools in the area as well as second phase team. We will inform schools about the SeaPerch club and invite them to start one and be a part of our competition in April. Each student leader will have a group of 4-5 students and these groups will build a SeaPerch with guidance from their peer leader, teacher facilitator and community champion. We will meet every Monday as a group and small group sessions will be conducted at least three times a week after school to provide more 1 to 1 instruction.

19-Aug Introduction to Seaperch
26-Aug Exploration of Navy and Underwater Challenges
2-Sep Materials and build discussion; watch beginning build videos
9-Sep Building the control box
16-Sep Constructing the frame
23-Sep Adding Motors
30-Sep FALL BREAK
7-Oct Propellers and Battery Connections
14-Oct Adjusting Floatation and Water Testing
Invite surrounding schools to test and 1 day with new club members
Pilot team present their Seaperch and inform audience of what they did
21-Oct Introduction to Seaperch
28-Oct Exploration of Navy and Underwater Challenges
4-Nov Materials and build discussion; watch beginning build videos
11-Nov Building the control box
18-Nov Constructing the frame
25-Nov Adding Motors
9-Dec Propellers and Battery Connections
16-Dec Adjusting Floatation and Water Testing

6-Jan Seapech/rover research
13-Jan Seapech/rover research
20-Jan This is how I would use a Seaperch innovative idea
27-Jan Seapech/rover Presentations

3-Feb How to run a competition
10-Feb What/who do we need for our competition

17-Feb BREAK
24-Feb Contact who and what
2-Mar Test Seaperch
9-Mar Make Seaperch modifications
16-Mar Prepare for competition
23-Mar Prepare for competition
30-Mar BREAK
6-Apr Prepare for competition

C. Describe the people involved (grade level/subject & # of students, teachers and/or staff, other stakeholders).

Grade level: Students in 3rd-5th grade will be invited to join the club.
Subjects: Science, Technology, Engineering, and Math (STEM) as well as Art and Computer Science
Number of students: 36 students will be directly involved with other students in the building having the opportunity to assist in other capacities and test ROV at school events.
Teachers/Staff: Math teacher, Technology coach, Art teacher, Writing lab teacher, Target teacher
Other stakeholders: Foundation member and community volunteer as the team champion, parent volunteers, YMCA board member, Ace Hardware school partner, and Field Core school partner.

D. Describe any professional development that you or others will complete prior to implementing the grant.

The teachers/staff and involved stakeholders will meet weekly starting pre-planning in July to watch SeaPerch training videos and devise a plan to carry out our goals.

E. Describe the materials needed for the project (provide links to relevant websites; include a written description of how the technology/ies will benefit students).

Students at Brumby will benefit greatly for this exposure. At first glance one may not see all the technology components to this project. Due to this being an after school program students will have access to other technologies that will be used during the building, testing and competing of the SeaPerch ROVs. Students will have access to computers, Ipads and 3D printer.

Students will use pvc to build the frame of the ROV as well as pool noodle to create buoyance. Students will then pot motors and test those using batteries and a digital multimeter and alligator motor test leads. Next the students will build the control box by using a soldering iron to connect toggles, fuses, modular jack onto a printed circuit board.

The SeaPerch program will benefit Brumby's shared technology vision is preparing digital age learners for success in a global ever-changing society. This also aligns with the goals of the SeaPerch program presenting technical career possibilities to girls, minorities, and underrepresented populations.

V. What is the timeline for assessing accomplishments and objectives/project outcomes (In 2-3 paragraphs, describe the program evaluation procedure. Explain how each objective will be measured and how success will be determined.)?

The timeline is described in IV part B. Student accomplishments and objective/project outcomes will be assessed at the culmination of each session. At the start of each session students will determine their goals for the day and then record their accomplishments by goals meet. If goals were not meet students will identify why their goals were not meet and how they used troubleshooting to solve their problem or how they plan to meet goals in the future.

Success will be determined after the build and test of each component of the SeaPerch ISTE standards will be evaluated formatively as students go through the building and creating process. Students will also be evaluated by completing a verbal, technology, or written explanation of process as well as answering questions from FieldCore representatives. The final evaluation is an engineering notebook that will be graded via a rubric (see link below to view rubric).

https://www.seaperch.org/engineering_process

V. How will the students be impacted by the project (In 2-3 paragraphs, include details regarding how the impact on students will be assessed and reported to students, parents, teachers, and others.)?

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Brumby's shared technology vision is preparing digital age learners for success in a global ever-changing society. This also aligns with the goals of the SeaPerch program presenting technical career possibilities to girls, minorities, and underrepresented populations. Student will be able to complete a real-world project with the application of grade level standards as well as technology standards. With this project based transfer of knowledge students will use higher order thinking skill. Parents, teachers and other stakeholders will have the opportunity to work with the SeaPerch students to gain knowledge. Program success will be communicated to others through the school news, club demonstrations and community news letter.

VI. What is the proposed budget? Include information on the following:

SeaPerch Supplies and Tools

A. Materials/supplies

SeaPerch Kit – List of Supplies

10 White PVC 1/2" - 90 Degree Elbow
6 White PVC 1/2" x 12" - Straight Pipe
4 White PVC 1/2" - Tee
1 Mesh - 12" x 8" - Black Polyethylene
2 Pool Noodle - 5" Piece
15 Cable/Zip Ties - 6" Black
6 Tie Wraps - Motor Mount - 11-1/4" - Blue

3 12 VDC Motor. 0.7 A - Shaft Diameter "0.091"
3 Film Canister - 35 mm or Plastic Vial - 50 ml
3 Propellers - Plastic 1/8" Shaft Size
3 Propeller Shaft Threaded Coupler
3 Threaded Insert Tee Nut
3 Nylon-Insert Hex Locknut 4-40 - Stainless Steel
1 50 ft. 350 Mhz Cat 5e Stranded Cable W/RJ-45
1 Velcro Cable Tie

1 SeaSwitch Control Box Kit
1 18 Awg Speaker Wire - 6'
1 Alligator Clips (Set of 2)
1 Black Alligator Clip Insulator
1 Red Alligator Clip Insulator

1 Solder - 60/40 Rosin Core
1 Butyl Rubber Tape - 1.5" x 3" (Monkey Dung)
1 Alcohol Wipe
1 Electrical Tape - Black – Roll
1 Wax Bowl Ring
1 Sealed Lead Acid Battery - 12 V, 7 Ah,
1 Sealed Lead Acid Battery Charger - 12 V, 500 mA
1 Battery Charger Cable - SLA Cord

1 Safety Glasses
1 SeaPerch Tote Bag
1 SeaPerch - 8" Ruler
1 SeaPerch Careers Brochure
2 Disposable Latex Gloves
1 Sharpie Marker - Black or Red
1 SeaPerch Pen
1 SeaPerch Tote Bag

B. Equipment

SeaPerch Tool Bag – List of Supplies

1 Tool Bag - Zippered Heavy Duty
1 Power Drill - Corded
1 Soldering Iron Stand
1 Sandpaper Sheet - 220 Grit
1 PVC Cutter - Ratcheting
1 Digital Multimeter
1 Wire Strippers
1 Adjustable Vice - Clamp-On
1 Krazy Glue
1 Alligator-Alligator Motor Test Leads
1 Soldering Iron - 25 Watts

1 Desoldering Pump
1 Nut Driver - 1/4" Non-Magnetized
1 Wire Cutters
1 Needlenose Pliers
1 Phillips Screwdriver - #2 x 4"
1 3/32" Drill Bit
1 1/4" Drill Bit
3 Alcohol Wipes
3 Threaded Insert Tee Nut
3 Nylon-Insert Hex Locknut
3 Propellers
3 Propeller Shafts
1 **SeaSwitch Spare Parts**

- 1 SeaSwitch - Complete
- 1 Modular Jack 8P8C
- 2 Fuseholders
- 2 Fuses 6.3A TE5 Radial Lead
- 2 Printed Circuit Boards

1 SeaPerch Construction Manual
2 SeaPerch Brochures

C. Total Cost of Proposed Project (include a line item for any required professional development)

$1,144.00
$1,000.00 (Competition fees)

D. Additional Funding Sources

YMCA
FieldCore

V. List your supporting references.

https://www.seaperch.org/about

https://www.fieldcore.com/

INSTRUCTIONAL TECHNOLOGY GRANT PROPOSAL
EVALUATION FORM/SCORING RUBRIC

Total Points (out of 300): _____

1. Impacts a variety of skill levels and/or learning styles or impacts an important target population.

   Possible number of points: 60 _____

2. Clearly identifies standards and learning objectives/project outcomes being addressed.

   Possible number of points: 60 _____

3. Pedagogically sound, based on research and/or best practices.

   Possible number of points: 60 _____

4. Clear plan for assessment of project and goals with examples of implementation methods.

   Possible number of points: 60 _____

5. Impacts large number of students and/or can be recycled/reused.

   Possible number of points: 60 _____

General Comments:

Adapted from: The Education Foundation of Oconee County, Inc.