Apple Progress Report

Envirolution

Reno, NV

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Contents

Introduction

Envirolution is pleased to submit this report to Apple Funding, Inc., in compliance with the requirements of the grant agreement. The report summarizes significant program accomplishments and how grant funds were used to support the operation and expansion of Envirolution's flagship program, Project ReCharge.

Project ReCharge is a hands-on, project-based Science, Technology, Engineering, Art, and Mathematics (STEAM) curriculum and training program dedicated to educating and preparing students to become future STEAM and environmental leaders and workers throughout the nation. Project ReCharge was established in 2014 after receiving Nevada's first National Science Foundation's Innovative Technology Experiences for Students and Teachers grant. The objective of this innovative program is to improve student literacy and involvement in real-world environmental stewardship through quality hands-on STEAM lessons and activities.

Project ReCharge was first implemented in the 2014-2015 school year. Since then, 114,081 students from 281 schools across six states have participated in the project. Of these students, 48% identify as girls or genderqueer, and 43% belong to a minority group across 23 rural and indigenous schools. The project has expanded significantly in the last three school years. On average, between the 2020-2021 and 2022-2023 school years, 46 schools and 3,468 students participated in the program as compared to the 2014-2015 through 2019-2020 average participation of 10 schools and 2,020 students per annum.

The curriculum consists of 22+ lessons that follow the 5E Learning Model and meet the standards of Generation Science, Common Core Math, and 21st Century Competencies. The 5E Learning Model structures each lesson, which also meets the criteria of the Next Generation Science Standards, Common Core Math, and 21st Century Competencies. Students learn about environmental and sustainability topics through engaging in STEAM activities and apply their learning and skills by creating solutions to environmental problems.

Project ReCharge Accomplishments

In the past year, Envirolution successfully expanded Project ReCharge into 12 new schools across three states: five in Nevada, one in Arizona, and six in Maine, collaborating with diverse school districts (SD), including Carson City, Lyon County SD, Clark County SD, Nye SD, Heritage Homeschool, Prep High School, Douglas County SD, and Washoe County SD. This expansion included training 23 new teachers, enriching the program's reach.

Key partnerships played a crucial role in enhancing our initiatives. Notably, our collaboration with Redwood Materials facilitated battery recycling for student projects, contributing to two impactful recycling events. Additionally, our partnership with McKinstry empowered students through energy measurement and planning, utilizing a dashboard for selected student projects. McKinstry also provided guest speakers for teachers and supported the development of curriculum around the energy dashboard, enriching the educational experience for local schools.

In our recruiting process, we heavily target Title I schools first and provide priority spots to teachers from these schools. Our PRC curriculum naturally provides differentiation strategies for students of all different backgrounds. Diversity, Equity, and Inclusion are the main components of our curriculum design

and instructional strategies. We also provided teachers with editable versions of all curricula to tailor their resources to their student demographics. All lesson materials are provided to teachers at no cost to them and remain with the teacher for the following years. In the past year, we recruited 8 teachers from Title I Schools and included approximately 1,030 students in Project ReCharge.

The Project Recharge curriculum was the most effective at encouraging student interest in pursuing a career in Engineering (39%), Art (33%), and Science (30%). While students indicated an interest in pursuing a career in these fields the most often, Project ReCharge was effective at stimulating growth in students wanting to pursue a career in Math (38% change). Project ReCharge was also able to get more students interested in at least one STEAM career.

The table below summarizes the Project ReCharge activities that were conducted with the support of grant funding.

Activity, Event, or Program	Description	Number of Events	Target Audience(s)
Project ReCharge Celebration	*A hybrid celebration and recognition event for PRC students to showcase their student-led projects. Students' projects were selected to be implemented. Awards and certificates for specific student projects and achievements were announced. Students attended virtually and in person.*	*Single Event on 5/10/23*	***Target Audience:*** *STEAM teachers, community members, PRC students, and their families* ***Number Reached:*** *160 attendees comprised of in-person students, teachers, and community members*
Project ReCharge Student Project Event: *Community Event: Recycling*	*For their PRC project, Eagle Valley Middle School students held a community recycling event in Carson City, Nevada. Community organizations that pursue sustainability came to discuss with the community the work they do to make Carson City more sustainable.*	*Single Event on 10/14/23*	***Target Audience:*** *Carson City residents* ***Number Reached:*** *12 students and community members*
Project ReCharge: *Summer Professional Learning Training with new cohort of PRC teachers*	*Completed 3-day professional learning training virtually to educate new PRC teachers about sustainability, energy and electricity, electrical generation, global warming/climate change, solar energy, wind energy, building envelope, passive cooling, passive heating, lighting, and appliances. Teachers completed 24 hours of professional learning. All teachers that attended the 3-day training received a printed binder and access to a digital binder for their grade level to allow them to easily access the curriculum and related resources for teaching.*	*3-Day Event on June 19th-21st 2023.*	***Target Audience:*** *4th-12th grade teachers* ***Number Reached:*** ● *28 teachers attended, 7 from Title I Schools* ● *2,450 students, grades 4th-12th*

Project ReCharge: *Follow-Up Refresh Training* *Participating Companies*	*Refresh Follow Up 3-day training for returning PRC teachers to learn about climate change, food sustainability, sustainable transportation, geothermal energy, and the United Nations Sustainable Development goals. The teacher completed 21 hours of professional learning and was provided with lesson plans and materials to use in their classrooms, as well as attended local sustainability companies to learn more about how to be sustainable.*	*3-Day Event on 7/24/23 - 7/26/23*	***Target Audience:*** *4th-12th grade teachers* ***Number Reached:*** ● *15 teachers attended, 8 Teachers from Title I Schools* ● *Approximately 1,800 students grade 4th-12th*
Project ReCharge: *Follow-Up Professional Learning: Energy and Electricity*	*Follow up training to explore simple circuits, series and parallel configurations, conductors and insulators, and energy changes. This unit also introduces our Energy Bike, which can power a lightboard and various appliances. These activities can be used to fill in existing gaps or to deepen prior knowledge.*	*Single Event on 9/9/23*	***Target Audience:*** *4th-12th grade teachers* ***Number Reached:*** ● *15 teachers attended, 6 Teachers from Title I Schools* ● *Approximately 1,800 students grade 4th-12th*
Project ReCharge: *Follow-Up Professional Learning: Food Sustainability*	*Follow up training to investigate the full circle of crop production and transportation to consider more sustainable ways to buy, package, and distribute food through collaboration, hands-on learning, and discussion. By the end of the lesson, participants will be able to identify the growing needs of various agricultural products and areas of the Earth where those needs are naturally met, explain the processes of farm-to-table production and transport as well as how a growing human population raises demand for agricultural goods, and identify the effect of agricultural product demand on planet Earth's environment, society, and economies.*	*Single Event on 9/26/23*	***Target Audience:*** *4th-12th grade teachers* ***Number Reached:*** ● *13 teachers attended, 4 Teachers from Title I Schools* ● *Approximately 1,480 students grade 4th-12th*
Project ReCharge:	*Follow up training to explore the exciting and complex world of geothermal energy, such as where it is found, and*	*Single Event on 10/14/23*	***Target Audience:*** *4th-12th grade teachers*

Follow-Up Professional Learning: Geothermal Energy	*how it is used to provide heat and electricity for homes and businesses. Students have multiple opportunities to discover information through hands-on learning, discussion, research, and collaboration*		***Number Reached:*** ● *15 teachers attended, 8 Teachers from Title I Schools* ● *Approximately 1,500 students grade 4th-12th*
Project ReCharge: *Follow-Up Professional Learning: Transportation Introduction*	*Follow up training to investigate their own understanding of transportation, explore a simple motor, learn about the history of transportation, and consider the properties needed out of the future of transportation. By the end of the lesson, participants will be able to evaluate their transportation methods and what qualities of transportation should be considered for their choices in the future, understand the history of personal transportation and how fossil fuels became the primary choice for powering vehicles, understand that electric vehicles can be an alternative to gas-powered vehicles by demonstrating how an electric motor works, and use this knowledge and experience to make environmentally responsible and cost-effective decisions about the future of transportation.*	*Single Event on 10/24/23*	***Target Audience:*** *4th-12th grade teachers* ***Number Reached:*** ● *8 teachers attended, 2 Teachers from Title I Schools* ● *Approximately 1,100 students grade 4th-12th*
Project ReCharge: *Follow-Up Professional Learning: Sustainability Detectives*	*Follow up training to learn how to create and analyze data and graphs from real world and current energy information from home and school energy bills. Participants compare home and school data to look for ways to improve energy efficiency and reduce costs. by collecting data on lighting, HVAC systems and occupant engagement or human behavior observations. Data collected during this lesson will be used in Student Sustainability Proposals.*	*Single Event on 11/18/23*	***Target Audience:*** *4th-12th grade teachers* ***Number Reached:*** ● *14 teachers attended, 5 Teachers from Title I Schools* ● *Approximately 1,500 students grade 4th-12th*

Student Projects

Student projects represent a key aspect of Project ReCharge. Students take action to develop and design their own projects focusing on sustainability. We held our 2022-2023 school year Project ReCharge celebration on May 10, 2023, showcasing an exciting array of student projects and climate actions with around 160 students, teachers, and family members in attendance. The following projects were selected for funding and currently in progress of implementation:

- Silverland MS- Community Lighting
- Eagle Valley MS- Clothing Recycling
- Eagle Valley MS - Battery Recycling
- C.C. Meneley Elementary - Composting
- Tonopah MS - Environmental Awareness
- Mt. Rose K-8 - Clothing Recycling
- Bitney Prep HS - New Planter Boxes
- Advanced Technologies Academy - Home Water Savings
- Heritage Homeschool - Greenhouses & plants.

Current students are developing their student projects for 23-24. We anticipate by May 2024 to have 50 fully developed student projects from participating schools. At least 5 projects will be implemented through other funding sources.

We eagerly await the culmination of this year's efforts, confident that the collective actions of our students will leave a lasting impact on both their immediate surroundings and the broader sustainability landscape, thanks to the support of the E-STEM grant.

Student Testimonials

"It changed my thoughts about my future career because I realized that I could change what I don't feel like should be right. I can also help the community by using some of the things that I learned in PRC." - 6th Grader - Mount Rose Middle School, Reno, Nevada

"Being more hands-on helped me decide to pursue mechanical engineering instead of civil engineering, as I wanted to work more with moving components and more with my hands and things that I could physically touch." - 12th Grader - Advanced Technologies Academy, Las Vegas, Nevada

"I believe these lessons reinvented my ideas of sustainability because they used to just be connected to recycling. But when you bring into the picture the energy grid of the world, it gets more interesting. I think the sustainability of the earth is important and that it could become a job option someday." - 10th Grader- Reed High School, Sparks, Nevada

Project Media and Publicity

Project ReCharge celebration 2023 was a great success on May 10, 2023. The post-event website (being updated post-event) and media can be viewed at the link below. Additional pictures are attached.
https://envirolution.org/project-recharge-celebration-2023/

Pinehurst Academy Project:

https://www.facebook.com/Envirolution/videos/258266859879279/

Doral Academy Project:
https://youtu.be/ArzU0X3R-Nc

Project ReCharge Refresh Professional Learning:

KOLO8, Reno's ABC affiliate, broadcast a news report on Envirolution's "Recharge Refresh Professional Learning" program offered in partnership with Ormat Technologies, a renewable energy company, for educators in Washoe County, Nevada. The news report can be viewed at the link below.:

https://www.google.com/url?q=https://www.kolotv.com/2023/07/26/ormat-technologies-envirolution-allowing-educators-learn-about-renewable-resources-nevada/&sa=D&source=docs&ust=1698615357097234&usg=AOvVaw3JIA4JmPT8rY4__SM8iVx3

Challenges and Lessons Learned

The biggest challenge we have encountered is maintaining teacher participation and continuity. There are several reasons why this is happening - teachers are reassigned to a new class or grade, transferred to a new school, or increasingly overwhelmed by the increasing demands of their job and withdraw due to lack of time to support PRC.

Additionally, the impact of geographic expansion, particularly as we extended our programming from the West Coast to the East Coast, was a learning opportunity for our team. The challenge we encountered was the substantial difference in time zones, which posed a barrier to ensuring the active participation of individuals on the East Coast in our training sessions.

Lastly, our staff and operations were tested throughout this past year. Through an executive and program leadership transition, our small yet dedicated staff demonstrated remarkable resilience in handling these challenges. They adapted to the demands of our programs and ensured seamless execution of our programs. However, as we aspire to further expand our initiatives, it has become evident that our current staffing capacity may require augmentation.

Looking Forward

Beyond this award period, Project ReCharge is poised for strategic growth. The E-STEM grant has played a pivotal role in positioning us for further opportunities, including funding sources and potential partnerships. We aim to deepen our roots in existing communities and forge new collaborations that align with our mission. Specifically, building on our successful expansion, we plan to deepen our reach in Maine, cultivating stronger connections within the community.

We seek to expand our PRC programs to include new curricula, such as battery recycling and other high-priority topics. The expansion we demonstrated through the E-STEM grant has allowed us to develop more partnerships and scalable and focused efforts to make an even greater impact on the greater communities. For example, the US DOE is providing funding to develop and promote programs to recycle Lithium-Ion batteries to create a circular economy, and we hope to build in battery recycling as a new lesson in our curriculum and allow students to design student projects directly related to battery recycling. This multifaceted approach underscores our commitment to scalable, student-led solutions for environmental stewardship.

As a result of our successful expansion across the country, we have garnered significant interest and support from The College of The Atlantic in Maine. Recognizing the positive impact of our program in the region, The College of The Atlantic is actively pursuing additional funding to support and expand our initiatives in Maine further. We could not have made such an impressive impact in Maine without the support of E-Stem, and we are excited to develop this partnership. Next year, we anticipate 20-30 teachers from Maine alone to participate in Project ReCharge and are excited to continue to expand from there.

The E-STEM grant has been instrumental in catalyzing our trajectory, serving as a catalyst for growth, collaboration, and innovation in the pursuit of our project's long-term success.

Use of Grant Funds

Budget Category	Proposed	Actual
Personnel		
Salaries	$34,500.00	$37,325.81
Fringe @25%	$8,626.00	$9,331.45
Total Personnel	$48,165.00	$46,657.26
Part-time/Contractual	$5,040.00	$5,699.00
Professional Learning		
New Teacher Stipends	$5,000.00	$350.00
Master Teacher Stipends	$2,000.00	
Curriculum Binders	$1,000.00	
Virtual Teacher Training Packages	$1,000.00	$2,500.00
Misc. Supplies	$1,345.00	$630.24
Total Professional Learning	$10,345.00	$3,480.24
Equipment and Supplies		
Classroom Materials	$6,000.00	$7,152.54
Office Supplies/Consumables	$480.00	$930.56
Total Equipment and Supplies	$6,480.00	$8,083.10
Shipping and Postage	$300.00	$508.39
Travel and Transportation	$500.00	$1,361.48
Total Direct Costs	$65,790.00	$65,789.47
G&A %14%	$9,210.00	$9,210.53
Total Grant	$75,000.00	$75,000.00