Green Dot Award: Challenger Learning Center

1. Background information about EIRC.

Educational Information and Resource Center (EIRC) is a public non-profit agency established in 1968 with New Jersey Local Education Agency (LEA) status, and has a 501C.3 educational foundation. EIRC is a state registered provider for professional development specializing in education-related programs and services for parents, schools, communities, nonprofit organizations and privately held businesses throughout New Jersey. Programs reach into more than 36 states and 8 foreign countries. Four years ago the EIRC installed an 88kw photovoltaic system on their building which receives $30k each year from the Solar Renewable Energy Credits and has decreased the utility bill from $3,500 to $600 a month.

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2. Detailed Explanation of Project.

The Educational Information and Resource Center (EIRC) is currently in the planning stages to construct a "Green", Challenger Learning Center (CLC) that will focus on Science, Technology, Engineering and Mathematics (STEM) education. Our educational business plan is three-fold; first, develop educational programs that inspire and hook student interest in the areas of sustainability as well as establish a pipeline for the future workforce in STEM and Green Collar Careers; second, train teachers in the STEM fields in order to better prepare students in the critical global challenges that our planet faces now and will face in the future; third, construct a green building to be used as a teaching tool demonstrating integrated systems. The ability for the US to sustain its scientific and technological superiority will depend upon our actions to maintain a competitive edge in the 21st century. Given the lack of US student enrollment in the STEM areas and the enormous commitment demonstrated by other countries to succeed in science and technology, the US is truly at risk. Our approach incorporates the building as a teaching tool and developing green curriculum and green programs that challenge students to problem solve, take action steps and implement sustainable measures in their, home, school and community. Establishing a pipeline of well educated students is critical to ensure that there will be future engineers, scientists, technicians that will secure a sustainable future.

Students learn better about concepts and content when there is interest and when the topic is relevant to their lives. The environment and high-tech topics clearly meet this criterion. This project was jumpstarted by a donation from Lockheed Martin for the space technology component (The Challenger Learning Center). Through the CLC, students learn about space operations and habitats, and understand and apply sustainable and regenerative approaches for earth- based application. Our concept and design consists of a unique combination of educators and green professionals that will work together to bring sustainability education to younger children, (the beginning of the pipeline) where it is needed most. The building design was created by the Cubellis architectural and design firm. Cubellis and their affiliates/contractors and product distributers will support demonstration of the systems and products in a way that will educate children about green buildings, energy efficiency, sustainable materials, and the related health benefits for using these technologies. In addition, green professionals will serve as mentors for students to help them develop problem solving skills, learn to work together as teams and understand goal setting. The CLC will seek a high-level of LEED certification from the US Green Building Council. The building will also serve as a regional hub to help raise student interest in

academics, enhance teacher professional development and be a showcase for green building practices. The CLC is currently slated to be built at the South Jersey Tech Park on the campus of Rowan University. The programs currently under development will inspire students to become the next generation of leaders and innovators of the STEM workforce. There are 53 other Challenger Learning Centers throughout the country. On average 10,000 children visit each Center every year. It is anticipated that this southern New Jersey CLC will be well above that number due to its location in the greater Philadelphia region. We anticipate offering post secondary training and education programs from this CLC to the other 53 centers, disseminating information to other national organizations and presenting at local and national conferences.

3. Programs to be delivered to a student and teacher audience:

The "**Green Machine**," is a traveling van bringing sustainable education to schools across the greater Philadelphia and southern New Jersey region. The Green Machine will be an alternatively powered vehicle which will house hands-on discovery kits that feature pre-engineering content and earth system science material. Examples of programs that will be developed include: Exploring Transportation Alternatives, Growing Local Gardens, Designing a Regenerative Future, Zero Waste Society… "Reduce, Reuse, Recycle", Using Local Resources, LEED for Schools, Student-run Energy Audits, and Developing Stewardship.

Green Apple Curriculum. The Green Apple Curriculum will be vertically aligned from Kindergarten through 12th grade with units, activities and additional online resources to support the curriculum. The content will be scaffolded across these grades in order to establish a pipeline of education and provide resources and information regarding green collar careers for the 21st century student. At the K to 4th grade level the activities will be inquiry based and will be an introduction to the student's local environment and to the natural world. At the Middle school level, a project-based approach will be developed and the LEED process will be introduced through units of instruction that will mirror the LEED for Schools rating system. Students will learn the connections between building systems and resource conservation. At the High School level, open ended problem based approaches will be presented in order to establish that what we do locally matters globally. Students at this level will also understand benefits and consequences of technology, develop problem solving and critical thinking skills that teach students the relationship between people, planet, profit and politics. Students will be encouraged to reach beyond the boundaries of their classroom and investigate community, state, national and global issues related to climate change and other pressing issues of our time. The curriculum will include a matrix aligning national educational standards to the activities. An online interactive content management system will be created to support the curriculum and to allow educators to share successful lesson plans, projects and best practices. This curriculum will serve as a guide for teachers and be structured in a series of units to allow for transitional use in the classroom. The units include: 1. Sustainable sites…Our Footprint on Society; 2. Water Efficiency, Pollution and Conservation…Go Green to Keep It Clean; 3. Energy and Atmosphere…Energy is Everything; 4. Materials and Resources…Reuse It or Lose It; 5. Indoor Environmental Quality…A Healthy Place to Live, Learn, and Play; 6. Innovation and Design Process…Time to Design.

Green Challenge. The Green Challenge program is intended to place the educator in the role of facilitator, presenting various opportunities for students to explore, discover, and understand how to

balance societal progress without sacrificing the environment. It is designed to be student led and teacher facilitated. Teachers are given a manual and professional development that will provide practical strategies for implementing the Green Challenge. Students will work in teams (maximum 4 students per team). A portfolio of each team's work will be submitted for review prior to an end of year exposition where multi-district teams showcase their work and are judged/awarded accordingly. The Challenge will be student centered and delivered in a thematic Problem Based Learning approach. The Green Challenge program is intended for students, grades 6-12 to investigate methods for transforming their environment (their habitat) into a healthier place to live, work and play. Students will come to understand and begin to implement sustainable practices, both inside and outside of their school walls. This Challenge creates the platform for life-long learning where students will discover that sustainability may be viewed as a way of life and consequently, when they become part of the workforce they will have the knowledge to contribute practical experiences to ensure a sustainable future. By participating in the Green Challenge program students will have the opportunity to design and engineer green solutions that can be applied in the real-world context. They will understand that they have the ability to make changes in their homes, their schools and in their communities. Our goals and objectives are:

- to create a collaborative learning experience for students by expanding their knowledge and understanding of sustainability and the connections between society, the economy and the environment
- to share innovative and successful outcomes from this program with other schools, parents, local communities, green facilities and staff
- to establish an environment for students to experience project ownership and have a meaningful learning experience relevant to their personal lives and interests
- to develop action steps that will impact the environment in a positive way

Wings Over Tomorrow: is an innovative program to promote excellence in sustainability education through a combination of science fiction and real science utilizing the science fiction creations of Phillip Nowlan, renowned science fiction writer and creator of Anthony "Buck" Rogers. The EIRC has established a partnership with the Nolan Family Foundation to leverage the content and intellectual property of Nowlan's final work, Space Guards. Short stories in the areas of earth and space habitats will be the starting point to spark student interest to create stories related to sustainability. Students will use art, writing and their imagination as a different approach to teach and understand essential earth system science concepts.

4. How the entry and its function/use maintains excellence in eco-sustainability in an environmentally friendly and responsible manner.

The EIRC will maintain excellence by developing and providing eco-sustainability education and resources for schools that will include a strong evaluation and assessment component in all of the educational programs developed to ensure the effectiveness of the process and delivery and the integration of contemporary methods and technologies. The Challenger Learning Center facility will be constructed using the latest and most efficient systems that can be monitored and measured and provide valuable data about green buildings to the general public on an on-going basis. In addition, we will work

with our affiliates to maintain excellence in education and accurate resource. They are: Lockheed Martin, International Technology Education Association (ITEA), The NJ Department of Education, NJ Department of Environmental Protection Agency, US Green Building Council—NJ Chapter, National Alliance of State Science and Mathematics Coalition (NASSMC), Alliance for New Jersey Environmental Education (ANJEE), NASA Goddard Space Flight Center Education Specialist Services, Stevens Institute of Technology, National Challenger Center for Space Science Education and the National Oceanic and Atmospheric Administration (NOAA)