Creating a Legacy of Sustainabili for Putnam Valley Schools

Victoria Garufi
Katie I. Ginsberg
Lisa Mechaley

ity

Photo: Children's Environmental Literacy Foundation and Putnam Valley Central School District

A Foundation for Sustainability

Located about fifty miles north of New York City, the small community of Putnam Valley offers its 11,000 residents beautiful views of gently rolling hills and hundreds of wooded acres close to the Hudson River. In the 1830s, the first one-room schoolhouses were established in the area. These schools served students who lived within walking distance and were the only source of primary education until the Putnam Valley Central School District (PVCSD) was established in 1935 in a lovely brick building that now serves as the elementary school. Today, the district is comprised of an elementary, middle, and high school with 300 teachers and staff who serve 2,000 students.

An early and influential moment for the district came when PVCSD Middle School was converted from all-electric heating to geothermal heating in the summer of 1997. The reduction in the middle school's electric bill was significant enough that Paul Lee, the Putnam Valley Assistant Superintendent for Business at the time, convinced the district to install a geothermal energy system at the new high school. The state-of-the-art Putnam Valley High School was built in 2000, complete with an energy-efficient geothermal heating and cooling system.

Building on the success of these facility changes, the school board and administration collaborated to create an Energy Performance Contract (EPC) in 2016-17 with Consolidated Edison Solutions that added rooftop solar, energy efficient lighting, and door and window upgrades for the district. According to Dr. Frances Wills, PVCSD Superintendent, in an emailed statement, "The Board

Photo: Children's Legacy Foundation and Putnam Valley Central School District

of Education was interested in making a visible and meaningful statement about sustainability and energy conservation to build on the early implementation of geothermal energy. There was great enthusiasm about solar panels and expansion of the geothermal initiative to the elementary school. As part of the implementation process, the Board directed the administration to create a curriculum component that would ensure that the project engaged students in learning about their school environment and provided a hands-on connection with science and technology." Over the next two years, Putnam Valley will add an HVAC geothermal retrofit to the elementary school, reducing its oil use by 50% and saving the district 30,000 gallons of fuel oil each year. Solar photovoltaic roof systems will be added at all campuses, and indoor lighting in the district will be replaced with LED bulbs. These proposed energy savings will eliminate over 1,000 metric tons of CO_2 emissions each year.

Vision for Sustainability Education: Children's Environmental Literacy Foundation

PVCSD's website states its mission as "In partnership with our families and community, we will ensure that all students are engaged in a challenging, student-focused educational program, understand and assume their responsibility for life-long learning, work to achieve their personal best and become productive citizens in a diverse global society." In October 2016, Dr. Wills contacted the Children's Environmental Literacy Foundation (CELF) to explore CELF's professional learning services, as they support project- and place-based learning for environmental literacy. In November 2016, CELF's education team met with Dr. Wills and colleagues to discuss the district's goals and values, how the EPC would further the district's educational mission, and how CELF could assist with the curricular component proposed by the school board. CELF's work with the district would focus on developing place-based learning experiences that use the natural landscape to foster an appreciation of Putnam Valley's natural habitats and integrate indoor and outdoor campus facilities in instruction.

In June 2017, Dr. Wills shared an overview of the EPC project with the entire PVCSD faculty. CELF was introduced as a project partner whose role was to support development and integration of scaffolded curriculum units using the natural assets of the PVCSD campus and surroundings as well as connecting to features of the district's EPC energy projects. CELF engaged the teachers in an initial exploration of their individual conceptions of the meaning of "sustainability." The one-word responses were used to create a "word cloud" representing the collective vision of sustainability for the district. The "word cloud" was subsequently duplicated, framed, and displayed at the entrance to each school. It has become an effective motivator for staff, students, and parents to ask questions and learn more about the districtwide project. Building a common vocabulary around sustainability has been an important aspect of advancing the program and a unified vision for outcomes.

Designed for whole-systems change – across campus, curricula, and community – the EPC project engages district and building administrators along with twelve teachers from various grade levels and disciplines. This core group of fifteen forms the district's Sustainability Committee. Several committee members grew up and/or live in Putnam Valley and returned to teach in the area. These native "PVers" have expressed and demonstrated an especially strong attachment to the community and are committed to taking an active role in its stewardship. Their history as residents of the community provides important connections to the town's natural and built resources, and they are a key asset to the committee and overall project.

Connecting to Curriculum

Creating a Sense of "Place" at Putnam Valley Schools

The project's curriculum component began in the spring 2017 with an Inventory of Education for Sustainability (EfS) across curriculum and instructional practices. Based on the inventory's outcomes, teachers from the Sustainability Committee formed goals for participation in the following CELF Annual Summer Institute, joining sixty-five other teachers and administrators. During the four-day Institute, the PVCSD Sustainability Committee spent dedicated time together, along with CELF educators, learning how to identify existing curricular connections to EfS as well as gaps and opportunities to integrate new curricular resources.

Subsequently, throughout the 2017-18 school year, PVCSD Sustainability Committee members met regularly to share progress, and to consider new and innovative ways to integrate EfS into their existing curriculum and place-based learning opportunities for student engagement. CELF facilitated several professional development workshops with the Sustainability Committee to continue to build on the foundational work started during the summer. Teachers were introduced to the Big Ideas of Sustainability, co-developed by CELF and Shelburne Farms Sustainable Schools Project. The Big Ideas include twelve key concepts to use as entry points into curriculum connections.

With an emphasis on creating a sense of "place," PVCSD teachers began to envision the school grounds as an opportunity for student engagement and out-of-the-classroom learning. Some of the ongoing sustainability projects across grade levels and disciplines that were developed include constructing an outdoor learning classroom, implementing trash free lunches, and establishing green clubs in all three schools. Several middle school teachers from the PVCSD Sustainability Committee attended STEAM Education for Global Citizenship to Achieve the Sustainable Development Goals (SDGs) at the United Nations. Inspired by their experience, they developed a presentation on the parallels between the UN SDGs and Big Ideas of Sustainability and presented it to their colleagues on the committee.

As teachers met more often with CELF, they started to move away from projects and began integrating sustainability concepts into existing lesson units. These lessons were not fundamentally different from the original curriculum; they were enhanced by incorporating the Big Ideas of Sustainability. For example, the middle school Environmental Science teacher created a lesson measuring the energy output from different types of lighting. Students look at five types of light bulbs: Compact Fluorescent, appliance, halogen, incandescent, and LED. They look at the package that each bulb comes in and record the following data: wattage, lumens, life span, and price. Their task is to determine the heat output of each bulb as an indicator of energy efficiency. Students measure the proximate air temperature of each bulb when it is off, at different intervals while it is on, and at a couple of intervals after the bulb is turned off (to see how long it continues to release heat). Data is graphed to compare the heat outputs of each bulb and determine which is the most efficient in terms of heat output. Students look at price, the number of lumens, the wattage used, and the life span and make connections among the pros and cons of each bulb type, as well as the trade-offs incurred, depending on which type of bulb is used. This experiment ties directly to the curricular outcomes of the EPC.

Another example grew out of the fifth-grade science Plant Life unit, which focuses on agriculture and how many of our foods are processed. Here, the fifth-grade science teacher created an entire cross-disciplinary lesson about how far fruit travels. Students looked at how agricultural practices, as well as our food buying choices, impact our environment. For the final activity, each student brought in one piece of fruit, which would be used to make a class fruit salad. Students calculated the total distance

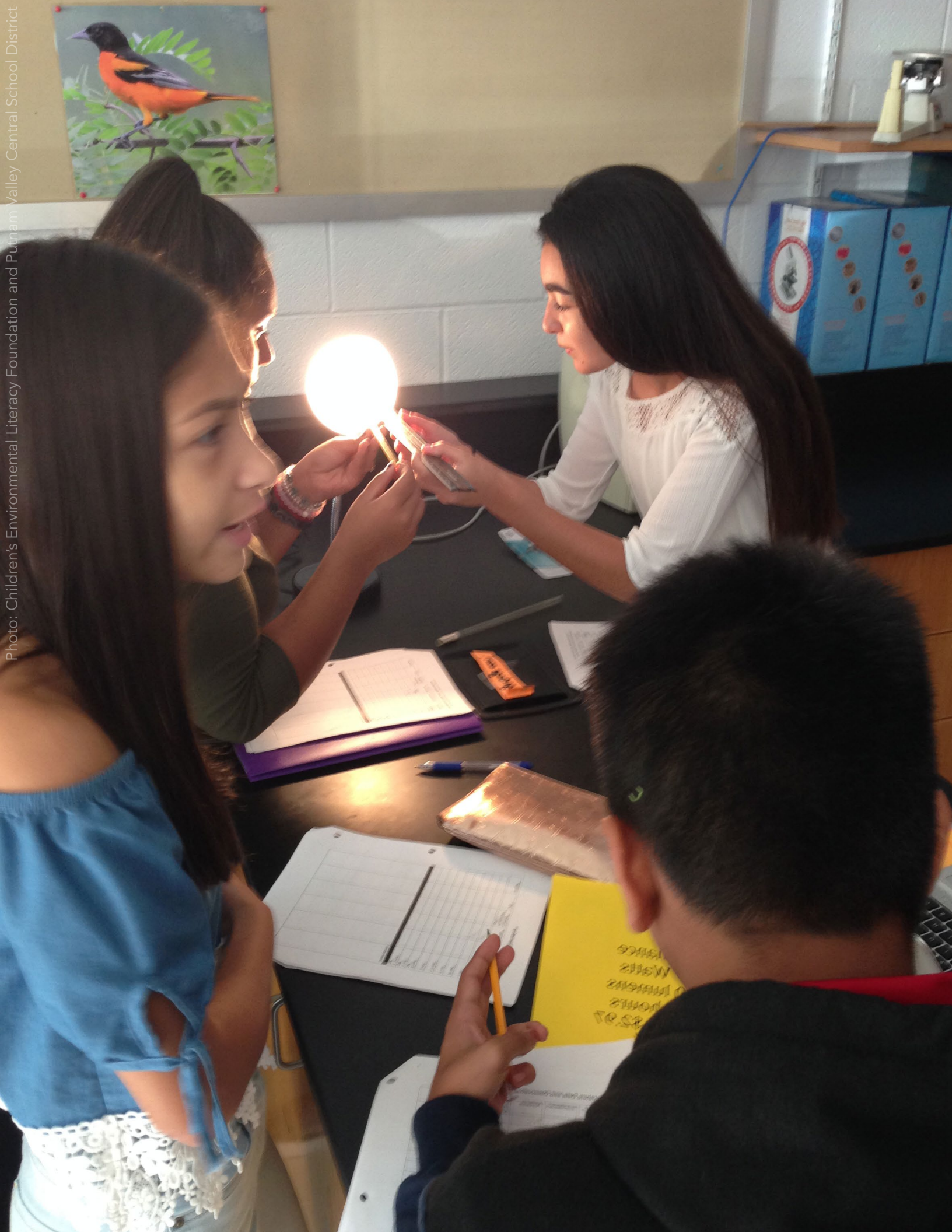

Photo: Children's Environmental Literacy Foundation and Putnam Valley Central School District

the "fruit salad" traveled to arrive in Putnam Valley. This sparked great conversation among the students and led them to brainstorm ways to plan for a more sustainable future.

Engaging the Community

Communicating the Vision for Sustainability

Connecting the PVCSD learning community with community partners is at the heart of the district's goals and the work of the Sustainability Committee. On a recent school day, the newly formed Middle School "Triple P Club" – Plants, Preservation, and Produce – hiked Granite Mountain, a property recently purchased by the Hudson Highlands Land Trust, one of the district's community partners. Representatives from the Land Trust and a local Audubon Chapter accompanied students on the hike to highlight nature's classroom. Other classes have been working with community members on similar projects within the school and community.

The high school AP Environmental Science class is in the process of working with the town board to complete a Natural Resource Inventory, focusing on the natural beauty in Putnam Valley. These students plan to upload images on the county's website, and this will serve as a bridge between the school and community.

As part of the action plan developed with CELF, the district launched Sustain Putnam Valley Week. Sustain Putnam Valley Week, held May 14-18, 2018, was an opportunity for all teachers in the district to explore the idea of connecting a lesson to the EPC project or other sustainability initiatives happening in the district. Teachers from the PVCSD Sustainability Committee took the lead and collaborated with their students and colleagues to highlight and share their ongoing work. The week's purpose was to gain further support and generate interest in leading and maintaining the legacy of a sustainable Putnam Valley.

To communicate the vision of the EPC contract and the school sustainability initiatives, a Sustainable PVCSD website was created by the technology teacher, and all members of the Sustainability Committee have access to it. This website informs the greater Putnam Valley community and provides a home for districtwide resources and curriculum. In November 2017, CELF educators reported on the district's remarkable progress to the PVCSD School Education Board, highlighting curriculum connections to the EPC project and other class projects that leveraged the natural assets of the Putnam Valley campus and surroundings.

Challenges and Solutions

Educating for Sustainability is a Process

Understanding and implementing EfS is a process that takes time. Lessons viewed through the lens of sustainability must meet state learning standards, and meeting these requirements demands careful effort. Although CELF's design framework includes standards that describe student outcomes, standards are not curriculum, and developing a curriculum unit takes time. Becoming fluent and comfortable with new instructional practices takes time, too. During the 2017 CELF Summer Institute, the sustainability team came up with a number of ambitious sustainability projects. Once the school year started, however, these projects became increasingly difficult to implement due to the time required. Over the course of the 2017-2018 school year, PVCSD administration and teachers became more and more comfortable with embedding sustainability into classroom culture rather than developing new sustainability projects.

Sustaining the Future for PVCSD

In the summer of 2018, CELF will support Putnam Valley teachers as they go deeper into curriculum integration and place-based instruction. During these focused curriculum design days, teachers will

create student-centered sustainability curriculum units using problem, project, and place-based learning practices, applying concepts like systems thinking, interdependence, and community to instructional practice. The summer curriculum design days will provide Sustainability Committee teachers with an opportunity to share their best practices and work with their colleagues to lead sustainable school change. The group's lesson design frameworks will be added to the district's curriculum map to share with the entire faculty.

CELF Summer Institute

The CELF Summer Institute equips teachers with practices and teaching methods to address the core concepts of Education for Sustainability: the intersection of social, economic, and ecological systems and how the balance of those three systems is vital to a sustainable future. Teachers also receive pedagogical training in "P3" (project/problem/place) instructional practices that bolster curriculum design and help them to design curricular units that utilize outdoor spaces on school campuses and throughout their communities.

Victoria Garufi (victoria@celfeducation.org) is Director of Education at the Children's Environmental Literacy Foundation (CELF), where she is responsible for guiding CELF's education team in planning and implementing all professional development programs. Prior to joining CELF, Vicky spent 12 years at the Sarah Lawrence College Center for the Urban River at Beczak in Yonkers. There, she designed, implemented, and oversaw all K-12 environmental education programs focused on the Hudson River.

Katie I. Ginsberg (katie@celfoundation.org) is Founder and Executive Director of the Children's Environmental Literacy Foundation (CELF). Through CELF, Ms. Ginsberg works with leading experts from around the world to bring best practices in Education for Sustainability to K-12 educators and schools. Under her directorship, CELF's client base has grown to include over 4,000 schools nationwide. Ms. Ginsberg is also actively involved in presenting at a broad range of seminars, conferences, and courses on sustainability and reorienting education through place-based and project-based education.

Lisa Mechaley (lisa@celfeducation.org) is an Educator at the Children's Environmental Literacy Foundation (CELF). In this role, Lisa designs, implements, and delivers professional development programs to teachers throughout the Northeast. Prior to joining CELF, Lisa spent more than 15 years teaching middle school science. She also served as education director for the Hudson Highlands Nature Museum, worked as a staff developer through Bank Street College, and developed and conducted environmental programs for Hudson Valley conservation and educational organizations.