

Mendon-Upton Regional School District – Massachusetts

Over the past several years the Mendon-Upton Regional School District (MURSD) has made a strong, concerted effort to do its share to reduce our carbon footprint, and in the process, be very public about it with our students and the community.

Pillar 1: Reduced Environmental Impact and Costs

Pillar 1, Element 1A: Improved energy conservation/energy-efficient building(s).

Within the last two years, the district has entered into a net metering solar power purchase agreement (PPA). Our contract calls for 2.4 million kWh of solar production, as the production is generated from two ground arrays in Dighton, MA and a series of seven large solar carports on the campus of the district's middle school, Miscoe Hill Middle School. These structures have become a valuable visual reminder of the importance of renewable energy for both our students and the community. In fact, the 800,000 kWh produced from the solar carports are enough to power the middle school. An added benefit is the cost that the district is saving, as with this PPA we pay \$0.0949/kWh for the solar power. With a 2% escalator over the 20-year term of the contract, the most the district will pay will be \$0.1383/kWh. Hence, this is a stable yet cost-effective expenditure for the district.

In 2016, we also worked with National Grid to retrofit every single interior and exterior lighting fixture in the district (4 schools plus central office) to convert them to LED fixtures. While it is a five-year \$619,000 capital investment by the district, our initial projections of reducing annual kWh usage of over 500,000 kWh are coming to fruition.

Between the solar PPA and the fixture retrofit, we are saving approximately \$132,000 in electricity costs annually. Our district Director of Maintenance/Buildings & Grounds has been scrupulous in finding multiple means to reduce waste and find savings across the district. Within the last four years, the district has also converted its two elementary schools from oil to gas for the purposes of heating. Additionally, all four schools in the district have their HVAC systems using the latest technology through energy management applications that control heating and air ventilation to optimum comfort and efficiency.

Pillar 1, Element 1B: Improved water quality, efficiency, and conservation

Half of the schools in the Mendon-Upton Regional School District have well water and septic systems. As a result, the district's buildings & grounds/maintenance staff are highly focused on water quality and conservation. The district has a trained, certified water quality specialist on staff who consistently monitors the quality of the water using a relatively newly installed (2015), state-of-the-art pressure filtration system and, if necessary, treats it to remove any contaminants.

The district has also made great strides in conserving water. All sinks, toilets and urinals are equipped with a low volume flushometer to conserve water and be less taxing to the septic systems. Each of the school's hot water tanks are also automated with time clocks to optimize run time. Less water is also used in the schools for cleaning purposes, as the green cleaning products are dispensed using dilution control systems. These systems automatically mix cleaning concentrates with water and accurately dispense into spray bottles or buckets. These systems also require less packaging, transport, energy, and water. The system also reduces overuse of the product that would result in leftover cleaning products

being poured down the drain and taxing the septic system. These often unseen and unnoticed steps help to conserve energy and reduce waste.

Students within the district are also doing more to conserve water. A group of 11th and 12th grade Advanced Placement Environmental Science students recently organized a successful *GoFundMe* Project called [Education Through Hydration](#) where they raised \$2,500 to purchase and install water bottle filling stations in our school. These replaced traditional water bubblers on campus with the intent of reducing or eliminating single-use, plastic water bottles.

Pillar 1, Element 1C: Reduced waste production and improved recycling and composting programs

For the past five years, the district has been a 1:1 learning district, as every student in grades 5-12 uses an iPad as a technology device to enhance communication, collaboration, and innovation (more information may be found at www.mursd1to1.com). As part of this larger strategic objective, the district has reduced the amount of copying and paper usage by over 50% in that time span through conversion to online/digital resources across all content areas. In fact, for all core academic subjects, digital texts have replaced traditional textbooks as a key curriculum resource for all middle and high school students. This tangible shift has been enabled a mindset of the importance of "going paperless" in today's technology-omnipresent society and hence, reducing waste.

Spearheaded by students at our district's high school, Nipmuc Regional High School, the district has also begun to address the issue of food waste. The Food Services Department has forged a new partnership with [Maple Farm Sanctuary](#) in Mendon to take food waste from our cafeterias and feed the approximately 100 rescued farm animals that live on the sanctuary. Certain uneaten food waste (mostly fruit and vegetables) is collected and donated to the sanctuary each Wednesday and Friday. This program has been educational for students at all four schools and has engendered a great deal of goodwill in the community.

In an example of service learning in the name of recycling and sustainability, students in environmental chemistry have taken on the challenge of raising awareness about recycling and supporting recycling efforts in the school. The students provide each classroom with a recycling container and make weekly visits to the classrooms to collect recyclables that they then provide to the town's recycling contractor.

Additionally, all paper towels and toilet tissue throughout the district consist of rapidly renewable fiber (RRF) made from Eucalyptus and Acacia trees, which can be harvested every 6-8 years (less than half as long as traditional old growth trees). As paper products, they also biodegrade much more rapidly. Throughout all school bathrooms, Green Seal foam hand soap is used. This soap produces less lather, thus enables quicker rinsing and less water usage. Last school year "no touch" towel dispensers were also installed in all school bathrooms. These units dispense one sheet at a time, producing less waste. Additionally, all custodial staff use microfiber mops and cloths for cleaning. These tools require much less laundering and on average, last 4-5 times longer than traditional cloth/cotton implements. Hence, there is less landfill waste.

Pillar 1, Element 1D: Use of alternative transportation to, during, and from school

Because of the relatively rural, dispersed nature of our two communities, there we do not have large numbers of students who walk to the district's schools. However, the two towns do maintain safe, spacious sidewalks that stretch two miles in each direction from each of our four schools. Each fall the district promotes for all students and their families in grades K-8 *Walk to School Day*, a collaboration between schools, the Hockomock-Area YMCA and *Safe Routes to School* designed to promote walking and healthy exercise among our younger learners. In a similar vein, the district also sponsors several other walk to school events and walks between our schools (e.g., our middle schoolers walking to the H.P. Clough Elementary School) to raise funds for local charities such as the Mendon and Upton Food Pantries and the Giving Tree Program during the holidays.

Approximately 70% of our 2,300 students take the bus to school each day. Our transportation provider, Tellstone & Son, has been able to consolidate several bus routes with the district to increase efficiency, and hence reduce our carbon footprint. Additionally, we work with our 11 neighboring districts in the Blackstone Valley Consortium to share expenses for transportation costs of students attending both vocational technical programs and out-of-district special education placements.

Pillar 2: Improved Health and Wellness

Pillar 2, Element 2A: An integrated school environmental health program

The Mendon-Upton Regional School District has an integrated school environmental health program that addresses students' physical, academic, social, and emotional needs. The district has had an active, vibrant District Wellness Committee involving all stakeholders—students, staff, parents, administrators, and community members—for several years. Their role is to inform district policy and procedures with regard to student physical and social-emotional well-being as well as ensuring that the physical environment of the district's schools remains safe and healthy.

Of note for this element, the committee has been active in improving indoor air quality (IAQ), particularly in the district's oldest school, the 58-year old Miscoe Hill Middle School. The committee has worked very closely with the district's Director of Maintenance/Buildings & Grounds to procure a new, computerized energy management system to regulate the HVAC system in each of the district's four schools. In 2015 the committee has also worked closely with the Regional School Committee to successfully advocate for the capital purchase of upgraded unit ventilators for all middle school classrooms, dramatically improving air quality and ambient temperature. Additionally, as mentioned previously, all four schools in the district have their HVAC systems using the latest technology through energy management applications that control heating and air ventilation to optimum comfort, quality, moisture level, and efficiency.

As we've emphasized a safer, healthier physical environment, the district has been using strictly green cleaning products for at least a decade. The district's Director of Maintenance/Buildings & Grounds procures products used as cleaning agents that are only Green Seal certified.

Pillar 2, Element 2B: High standards of nutrition, fitness, and outdoor time

The committee has also been instrumental in improving our existing offerings to our Physical Education/Wellness program across the district. The committee has written grants to the New England Dairy Council to support the [Fuel Up to Play 60](#) program at H.P. Clough Elementary School. This program has promoted healthy habits, providing rewards for students who engage in at least an hour of exercise of exercise daily as well as eating nutritious meals. Grant funds have been used to purchase athletic and sports equipment for the school's before-school care program (which serves over 100 students) and to start a "grab and go" nutritious breakfast program for these students. The program has been so popular that it has been replicated at Memorial Elementary School in Upton.

In the last four years the District Wellness Committee has been active in promoting healthier eating for our students, particularly by aligning all school breakfasts, snacks, and lunches with the revised federal guidelines from the USDA per the Healthy Hunger-Free Kids Act. As a result, the lunches now offer dramatically fewer processed foods, less sugar, more whole fruits and vegetables, and more fresh-baked goods made with whole grains. After a slight implementation dip, cafeteria sales increased and the MURSD Food Services Program has been in the black for the past three years.

Over the course of the past three years, both Miscoe Hill Middle School and Nipmuc Regional High School have designed and implemented Wellness Weeks, innovative programming focused on supporting students' social, emotional, and physical health. Held during the fall and spring, Wellness Weeks provide students with a week-long focus on developing skills and building healthy habits that support wellness throughout the entire year. Wellness Week is supported by faculty members and community partners who offer students a range of workshops and activities from physical fitness to healthy eating to mental relaxation activities, and many more. Some of the most popular activities include exploring the outdoors in healthy walks and building bonds with therapy animals as a way to de-stress and reduce anxiety. For examples of the wide variety of community partnerships, themes, and activities that support student wellness please visit <http://www.nipmucwellness.weebly.com/>. These activities are reinforced in each school's weekly advisory program throughout the entire school year.

While there have been the aforementioned proactive structures put in place for all students, there are a growing number of students with significant mental health needs. Our schools are staffed with guidance and school adjustment counselors, but often that is not enough to handle students experiencing behavioral issues or those who have been diagnosed with a serious mental illness. As a result, in the past three years the district has crafted formal partnerships with [Riverside Community Care](#) of Upton and the [Family Continuity](#) of Whitinsville. Both agencies provide resources for students and families in crisis, as clinicians provide counseling services in our schools and provide wraparound services such as in-home family therapy and therapeutic mentoring. These partnerships have been valuable for the district to address these critical needs.

Pillar 3 – Environmental and Sustainability Education

Pillar 3, Elements 3A and 3B: Interdisciplinary learning about the key relationships between dynamic environmental, energy, and human systems; Use of the environment and sustainability to develop STEM content, knowledge, and thinking skills

Environmental education is pervasive throughout the district at every level. Although the emphasis for our youngest learners is on literacy and numeracy, environmental science is embedded within the school culture. For example, one cannot help but notice the large community garden adjacent to the

entrance to H.P. Clough Elementary School in Mendon. Constructed by students and grant funded by the Hockomock-Area YMCA, it involves all students, PK through grade 4, in understanding how seeds germinate and vegetables grow and provide nourishment. The garden's vegetables are used in the school's cafeteria salad bar and during the summer months, are donated to the Mendon Food Bank. The school has also partnered with the Mendon Senior Center, who lends volunteers to help the students with garden maintenance and watering. It has been an outstanding and satisfying partnership!

All Miscoe Hill Middle School 5th graders have a rewarding experience in October as they spend three days at Nature's Classroom in Charlton, MA. Meant to be a team and community-building experience, the program offers inquiry-based, experiential education focused on conservation. Most of activities have a strong focus in STEM areas. The Miscoe staff uses this powerful experience as a springboard for many other interdisciplinary units throughout the school year. Recently approved was a request to take 45 7th and 8th grade students (and 20 parents) to the Amazon during the April 2019 school vacation period. This unique trip will vividly illustrate many aspects of the middle school environmental science and social studies curriculum. Students will become more culturally aware, be pushed outside their comfort zones, be challenged in new ways, and grow as individuals. Highlights of the trip will include:

- Guided sightseeing of Quito, Ecuador
- Papallacta volcanic hot springs visit
- Crossing the Andes
- Amazon Animal Rescue Center visit
- Indigenous Kichwa community and school visit
- Amazon jungle hike
- Napo River white-water rafting
- El Pailon Del Diablo waterfall excursion
- Exploring the Rio Pastaza Canyon
- Tungurahua Volcano hike
- Cotopaxi National Park visit

In recent years, Nipmuc Regional High School has expanded its program of studies to include a range of courses that allow students to explore environmental education. Some of these courses include the following:

- *Ecology and Populations*: In addition to taking a full-year course in biology, all of Nipmuc's freshmen take an additional, innovative course called Ecology and Populations that provides project-based learning opportunities for students to investigate the biology of populations and their interactions with the environment. Students explore how living and non-living components of the Earth have changed through time and continue to change to create the diverse and extraordinary world in which we live.
- *Marine Biology*: Now in its second year in the program of studies, Marine Biology allows students to explore the physical environments associated with the world's oceans and the aspects of climate and climate change as they relate to oceans and the diversity of life that exists in marine environments.
- *Advanced Placement Environmental Science (APES)*: This course allows students to investigate the interrelationships of the natural world, to identify and analyze environmental problems (both natural and human-made), to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving and preventing them. Students in this

rigorous class have the potential to earn college credit as they gain an in-depth understanding of these concepts and apply their learning in the community.

Pillar 3, Element 3C: Development and application of civic engagement knowledge and skills

Students in Advanced Placement Environmental Science (APES) and Environmental Chemistry have the chance to design *service learning* projects that bring the curriculum to life through community service and volunteerism. For instance, students in APES had the chance to research environmental issues that were personally meaningful to them and design a community impact project that applied the curriculum in the real world. One example of this type of project, noted previously, comes from a cohort of students who sought to reduce the negative environmental impact of disposable water bottles on the community by raising awareness and raising funds to install water bottle filling stations. Through a community education program and fundraising campaign the group has raised enough funds to install a water bottle filling station in the school and has hopes to raise enough funds to install multiple stations by the conclusion of the school year.

21st Century Learning Conferences are innovative, full-day learning events that are modeled after professional learning conferences but offered to students. These learning events allow students to identify their passions and explore them through community partnerships and real-world learning opportunities. In our most recent 21st Century Learning Conference, students were encouraged to "Learn What They Love and Love What They Learn". In designing a day that encouraged students' interests, the school asked students to identify what topics they wanted to explore in more depth. Through this process, Nipmuc was able to provide unique opportunities for students learn more about environmental education. One example sessions included, "Nature in Winter: A Winter Hike and Journaling Session". Students and teachers worked together to hike through the snow deep into the woods nearby the school in order to seek signs of animal activity, connect with nature, and journal about their experiences. Another example is "Discovering Outdoors through Hiking" in which students travelled to the Blackstone River and Canal Heritage State Park where they met with a park ranger and explored the grounds of the park through a winter hike. In addition, a representative from emergency medical services joined the team to provide education about ways to stay healthy when enjoying nature. You can learn more about the range of offerings and experiences at Nipmuc's 21st Century Learning Conferences at this website: <https://nipmuc21stcentury.weebly.com/>

Nipmuc also is one of only two schools in Massachusetts to gain membership to the [National Consortium of Secondary STEM Schools](#), a national organization of schools with exemplary STEM programming. The school's membership is based in part on the variety of authentic and real-world STEM programs that it offers, including The Nipmuc STEM Scholars Program. The STEM Scholars Program provides students with rigorous academics, workplace readiness training, introduction to college learning experiences, and learning experiences in professional environments. One of the highlights of the STEM Scholars Program is the chance to engage in career shadowing. A wide variety of career shadowing opportunities have provided students with the chance to ignite their interest for environmental studies. You can learn more about Nipmuc's STEM Scholars Program and its membership in the NCSSS at this website: <https://nipmucncsssapplication.weebly.com/>

Furthermore, continuing in our efforts to partner with the community to further our cause, the district was just awarded an [\\$8,000 grant and partnership](#) with the [Massachusetts Clean Energy Center](#). The funds will be used to host a Clean Energy Activity Day for all 7th grade students on May 15, 2018. The grant will be used to purchase do-it-yourself solar and wind kits for students to assemble, along with other activities. Students will also be designing and putting together a solar-powered composting system, building off a previous project. Following the construction projects, Students will have the chance to ask questions — that they developed — to ask a panel of clean energy professionals from both the public and private sectors.