



Design a School Energy Curriculum

Schools can be a valuable portal for distributing information about clean energy to youth and their parents. Energy-related curricula with entertaining and interesting hooks educate students about energy issues and increase their awareness of energy opportunities, both in terms of their current behavior and their future interests. The [National Energy Education Development \(NEED\) Project](#) provides energy education and support to teachers and students across the country with the goal of increasing youth understanding of energy issues. Teachers and students can access a range of educational materials, including activity guides, books, games, and puzzles.

This strategy highlights just a few of NEED's curriculum options that have proven to be both cost-effective to implement and successful in improving knowledge and awareness of clean energy issues. The ability for schools to apply the recommendations for each topic will depend upon available resources, capacity, and student interest. Teachers and school administrators should assess which strategies will be most successful given the unique circumstances of their school.

Options for Curriculum Expansion

1. Efficiency and Conservation

- **Energy conservation contract** – With the Energy Conservation Contract, students discuss with their families their daily energy use and educate them about energy savings opportunities using the [NEED's Household Rating Guide](#). Family members are asked to sign a one-month Energy Conservation Contract to make a conscious effort to reduce their energy use. Students and their families revisit the Rating Guide and estimate energy savings at the end of the one-month period. Afterwards, students are encouraged to ask family members to sign another contract for a 12-month energy conservation commitment.

Why it is effective: This activity educates both students and adults about energy-saving opportunities, including conservation measures, appliances upgrades, and weatherization.

One step further: Work with the utility and energy service vendors to distribute flyers about utility energy efficiency programs along with the Household Rating Guide.

- **School Energy Survey** – Students follow step-by-step instructions in [NEED's School Energy Survey Guide](#) to gather and analyze data on energy-consuming appliances and

systems in their schools. Students document annual energy consumption, cost, and carbon emissions of appliances using information gathered from the nameplates of the devices, Kill-A-Watt monitors, and any other data already collected by the school or municipality. Based on the findings, students assess the costs and benefits associated with potential solutions and put together a school energy action plan. As an extension, students can monitor and evaluate their interventions on school energy consumption over time.

Why it is effective: This student-driven program educates students about all aspects of energy conservation, from cost to carbon emissions, and helps them apply their math skills, while providing them with a strong sense of accomplishment and of belonging to the school.

One step further: Allow student groups to prepare energy action plans and compete with each other. Teachers select the best plan based on costs and benefits. The selected plan can be implemented and energy savings monitored. The school announces the energy and cost savings on a regular basis to celebrate students' success.

City of Taunton – Gang Green (Student Energy Management Team)

In order to build its capacity to carry out energy management work and raise students' awareness of energy conservation, Friedman Middle School in Taunton created "[Gang Green](#)," a student group charged with monitoring and collecting energy data throughout the school building. The group presented data and created an energy management bulletin board identifying data collection schedules and zones that each student was responsible for covering. To motivate participation, all Gang Green student members received special T-shirts, hard hats, and certificates. This program received the Massachusetts Executive Office of Energy and Environmental Affairs Secretary's Award for Excellence in Energy and Environmental Education.

Towns of Acton and Boxborough – Green Council (Student Energy Management and Conservation Team)

Students from the Acton-Boxborough Regional High School initiated a series of energy efficiency, waste reduction, and water conservation efforts in their school following the Eco-Schools USA Program. The student-driven [Green Council](#) was developed to support the sustainability efforts and goals of existing clubs and organizations, such as the Recycling Club and Envirothon Team. The group developed the [Power Down Project](#) to promote energy and cost savings. Students monitored the energy consumption of on-campus electric appliances and conducted various outreach activities, including an Energy Fair and a faculty light bulb exchange program. The group reduced the school's electricity consumption by 15% over two years. The Green Council received Eco-Schools USA's Green Flag Award.

2. Energy Fundraisers

- **Mass Save's CFL Fundraiser Program** – Mass Save features a comprehensive fundraising program that provides both public and private schools in Massachusetts the opportunity to raise funds while teaching students about energy efficiency and conservation. The [CFL program](#) is a fun and interactive experience that educates students and their families about the benefits of compact fluorescent lights (CFLs), advanced power strips, and other energy-efficient products and conservation measures. Mass Save-provided fundraising kits

give students the necessary tools to sell discounted energy-efficient products to their friends and family.

Why it's effective – By providing energy-efficient products for sale at discounted prices, the program garners interest in how these types of products can help the average household. In addition to receiving the products for free, the participating schools get to keep 100% of the profits earned from any sales during the fundraising period. With the support of fundraising coordinators throughout the process, the program is a fun and educational experience that results in guaranteed funds raised.

Town of Bedford – Bedford Elementary Schools Together (NSTAR Fundraiser)

Bedford Elementary Schools Together (BEST) is a parent-teacher organization that plans to take advantage of the Change a Light, Change the World program through their utility, NSTAR. BEST is sponsoring a [Spring Fundraiser](#) in collaboration with NSTAR to sell energy-efficient light bulbs and power strips, with 100% of the profit going back to the schools. Light shows, music, and prizes are all part of a push to encourage students and their families to learn more about energy efficiency while raising funds for the schools.

3. Energy Sources

- **Energy Expos** – Students work in groups to create an energy exhibition to reinforce their knowledge and share information with other students. The activity covers a wide range of topics revolving around energy sources, such as renewable energy, fossil fuels, clean energy and greenhouse gases, the geography of energy sources, and the science of energy generation (examples can be found in [NEED's Energy Expos Guide](#)). The energy exhibits can be in any format, including posters, hands-on activities, demonstrations, presentations, and art and crafts. Students use their academic skills and creativity to effectively present their research effort to their peers, teachers, and parents.

Why it is effective: The activity facilitates peer-to-peer information sharing about renewable energy knowledge. Students learn about different sources of energy and assess the pros and cons of each source. Creating the exhibits also reinforces students' research, writing, public speaking, art, and other academic skills.

One step further: Work with solar vendors and the municipality to cohost the event, and invite families and the community to attend. Students present their energy exhibits during the expo, educating the community about renewable energy. Solar vendors and the municipality can also participate by pointing residents toward credible solar and energy efficiency opportunities. Schools can create a competition for the best exhibit(s), with winning students and their families receiving energy-related prizes sponsored by the municipality, utility, and vendors, such as free energy assessment services.

4. Transportation

- **Transportation Fuels Debate** – Students learn about different vehicle fuels through a constructive debate. Each student group selects a transportation fuel, such as gasoline, biofuel, natural gas, or diesel, and introduces basic information about the fuel to the

class. The groups follow with a presentation on the advantages or disadvantages of each fuel. The students then debate the pros and cons of each fuel for both personal vehicles and fleet vehicles. Teachers judge and select the winning team based on each group's ability to defend their proposition and challenge others. Detailed rules and resources can be found in NEED's [Transportation Fuels Debate Guide](#).

Why it is effective: The interactive activity facilitates information sharing and allows students to think about energy issues in a broader way. The activity also helps strengthen students' analytical and critical thinking research, collaboration, and public speaking skills.

One step further: Encourage students to interview local stakeholders that use the different transportation fuels. Students can learn about the rationale that motivates these drivers to pick their fuel, as well as the challenges they face, such as cost, availability, and energy efficiency.

Town of Norwell – Alternative Travel Group (Alternative Fuel Vehicles Project)

South Shore Charter Public School's Alternative Travel Group project educated students about alternative fuel vehicles and encouraged the community to reduce vehicle emissions. In 2009, the school launched the Veggie Van, a non-hydrogenated-oil-fueled vehicle that transported students to field trips and sports events. The van ran on used vegetable oil collected from local restaurants. Used vegetable oil was chosen among other clean fuels because of its low carbon footprint and its educational and environmental values. This innovative project not only educated students on alternative fuel sources, but also gave students hands-on experience with alternative fuels. The project received a Massachusetts Executive Office of Energy and Environmental Affairs Secretary's Award for Excellence in Energy and Environmental Education.

5. Raising Awareness

- **Energy Carnival** – Create a school-wide or community-wide Energy Carnival. Student teams rotate around carnival stations to participate in games such as ring toss that involve answering questions or solving problems to earn “energy bucks” (examples can be found in [NEED's Energy Carnival Guide](#)). Teams with the most energy bucks are awarded prizes. Individuals and families can also participate.

Why it is effective – Students and the community learn about energy issues in a fun way. Students not only apply their knowledge about various energy issues, but also exercise and develop team-building skills.

One step further – Partner with community stakeholders, such as local high schools, businesses, community organizations, and utilities. Invite local restaurants to sponsor food and prizes. This event can be used to educate the whole community about clean energy opportunities and the utility's energy efficiency programs.

Martha's Vineyard – Energy Carnival (School and Community Event)

The Vineyard Energy Project and the Cape Light Compact co-sponsored [Oak Bluffs School's Energy Carnival](#) in 2011. The Cape Light Compact provided volunteers and financial assistance for the carnival, and all stations were led by students in the Energy Club from Martha's Vineyard Regional High School. More than 350 students from Martha's Vineyard Public Schools and Martha's Vineyard Public Charter School participated in 15 station activities, which included making coin batteries, creating a human circuit, generating electricity from fruit, playing a wheel energy game, demonstrations of a Van de Graff generator, and games about energy efficiency and renewable power.

- **Current Energy Affair** – The Current Energy Affair activity is modeled after a TV news broadcast and allows students to report on major issues related to electric power generation. Students present to classes using information from NEED's Electricity Fact Sheet and the lead stories provided in [NEED's Current Energy Affair Packet](#).

Why it is effective – This role-playing activity facilitates peer-to-peer knowledge sharing among students and allows them to develop an understanding of a wide range of energy issues. Students conduct research and learn from each other's presentations about different aspects of electric power generation, including generation sources, distribution, management, and history.

One step further – Develop an ongoing news broadcast (e.g., during lunch or morning announcements) and ask different groups of students to present on an energy topic or issue. Students can also give an update on the school's clean energy progress.

- **Energy on Stage** – Students work together to put on energy plays based on familiar stories and characters, such as “Sparkle White and the Seven Dwarfuels” and “Harry Spotter and the Quest of Windy Myths” (examples of scripts can be found in [NEED's Energy on Stage Guide](#)). The plays can range from informal performances during class to elaborate staged performances with props and costumes.

Why it is effective – This interactive and entertaining activity enriches students' energy vocabulary and provides an opportunity for them to communicate with each other and build confidence through performance.

One step further – Put on a ticketed school energy play. Invite families and the local community to enjoy a performance by the students and learn about energy information. All funding can go to the school's clean energy projects and retrofits.

Resources

- “Curriculum Guides and Program Resources.” National Energy Education Development Project <http://www.need.org/curriculum-guides>
- “The Green Team.” Massachusetts Department of Environmental Protection. <http://www.thegreenteam.org>

- “Energy Education and Workforce Development.” U.S. Department of Energy.
<http://www1.eere.energy.gov/education/lessonplans/>
- “Teacher Resources.” KidWind. <http://learn.kidwind.org/teach>
- “Lesson Plans for Teachers.” Center for Energy Workforce Development.
http://www.cewd.org/educators_lessonplans.asp
- “Eco-Schools USA: Energy Pathway.” National Wildlife Federation.
<http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Energy.aspx>