



WILLIAM PENN MIDDLE SCHOOL ENERGIZING EDUCATION PROGRAM

Project Summary: Forty 7th grade science students began their school year learning about Ecosystems and Environmental Issues. In November our learning became “ENERGIZED” when we began investigating ENERGY. The teachers selected a group of 12 students to be part of a leadership team to be group leaders, participate in the special enrichment opportunities and to plan our community outreach event. This leadership team was called E.P.I.C. (Energy Protectors In our Community). From November to January we learned about Nonrenewable and Renewable Energy Sources, Energy Conservation and Waste Disposal.

Our school community outreach project was our Energy Expo that was held during both the daytime and the evening. At these Expos we educated community members of all ages about Energy Sources, Energy Conservation and Waste Disposal. We also participated in two STEM Challenges this year during which teams of students designed wind turbine blades and solar houses.

November 2017-April 2018

Advisor: Mrs. Kristin Slota



WPMS Energizing Education Program Goals:



1. To learn about nonrenewable and renewable energy sources and become more conscious of how we use these sources
2. To complete investigations and STEM Challenges to strengthen our knowledge about renewable energy sources
3. To learn how we can better conserve energy in our homes and at school
4. To share our newly acquired knowledge with our community

Learning about **Waste Disposal**

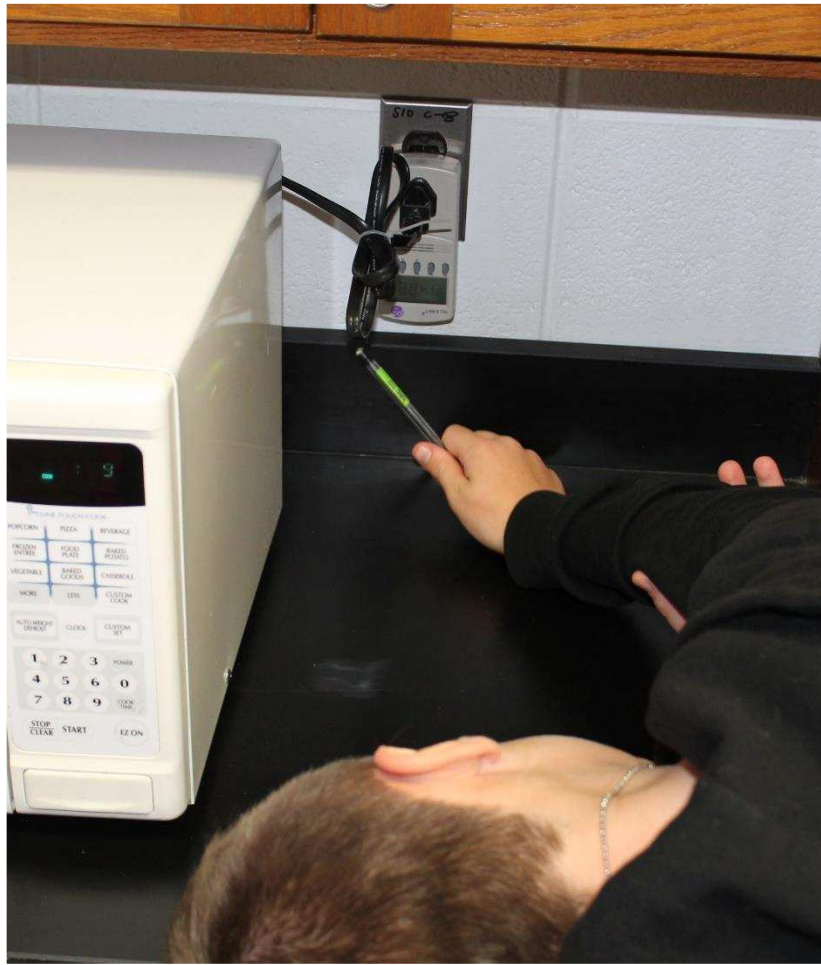


Thanks to our new partnership with Trash Daddy, we were able to visit Wheelabrator Falls, a trash-to-energy plant located in our community near our Landfill.

Celebrating America Recycles Day NOVEMBER 2017



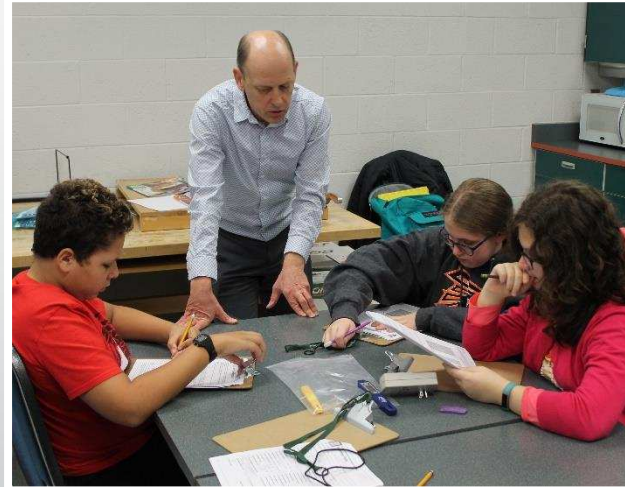
Our School Energy Audit with CEM Todd Rogers



A student uses a Kilowatt Meter to see how much energy is used by a microwave



Visit to the boiler room



The Energy Audit Team collecting data

On December 12th, fifteen William Penn students had the opportunity to work with Certified Energy Manager Todd Rogers. Our student teams collected data in several locations in our school about room temperature, lighting, water temperature and humidity using a variety of measurement tools. Mr. Rogers taught us how to use Kill A Watt Monitors, Humidity/Temperature Pens, Light Meters, and Digital Thermometers to gather our data. We also visited the boiler room to learn how the school gets our heat, air conditioning and hot water. After learning from Todd, we were ready to be audit team leaders in the April for the rest of our classmates when our entire class completed an audit.

Nonrenewable Energy Activities:

While learning about the nonrenewable energy resources (Coal, Natural Gas, Petroleum, Propane and Uranium), we participated in number of activities from the NEED resources. We used some of these activities when we shared with the community at our Energy Expo.



Cookie Mining



“Getting the Oil Out”



Renewable Energy Activities:

While learning about renewable energy resources (Solar, Wind, Hydropower, Geothermal and Biomass), we participated in many of NEEDs renewable energy activities. We used some of these activities when we shared with the community at our Energy Expo.



“Investigating Solar Energy”

“Investigating Wind Energy”



Creating Energy Chants



Student groups created their own Energy Chants to help remember important information about the renewable and nonrenewable energy sources we learned about in class.

The chants were performed for our classmates, the fifth grade students from Oxford Valley Elementary and all the guests at our evening Energy Expo.



Guests left our Expo unable to forget the catchy chants and engaging motions that we taught them.

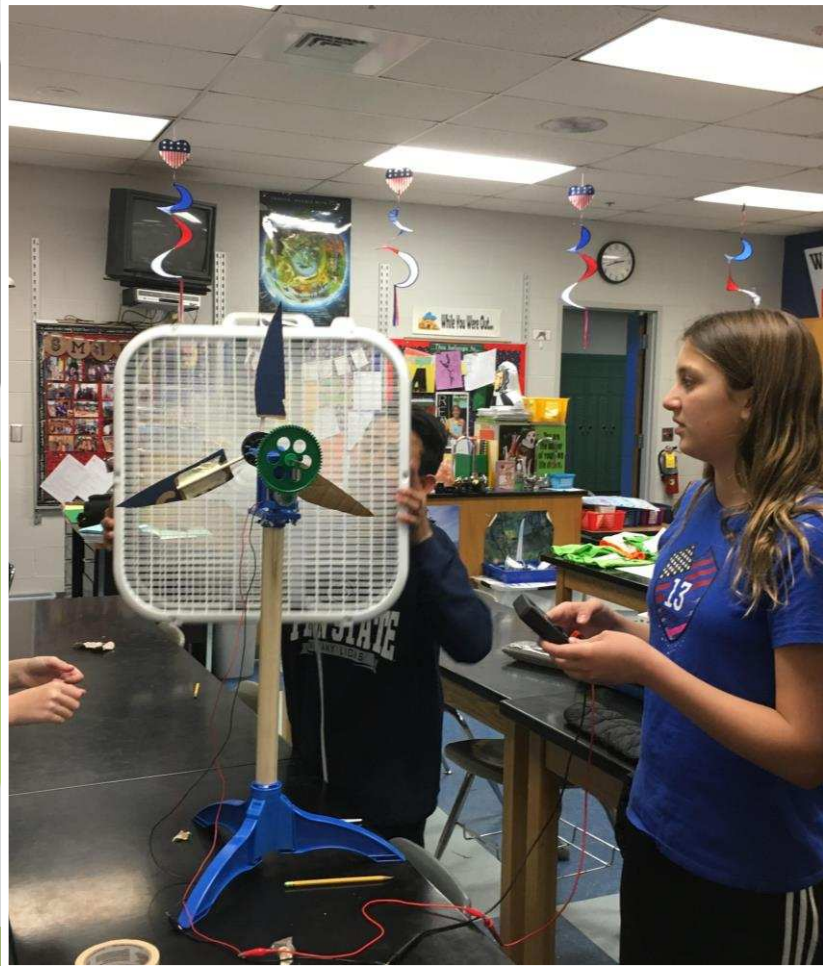
Our Classroom Extension to Exelon Renewable Energy Education Center in Fairless Hills, PA-

December 2017

In December, our classes visited the Exelon Energy Education Center where we learned more about nonrenewable and renewable energy sources. We created models of a renewable energy source using Play-Doh, played an energy conservation game show and built model wind turbines to test in the wind chamber. This experience helped us to better prepare for our Wind Turbine Challenge and our Energy Expo. We also learned more about saving energy in all rooms in our homes when we played in the “Hogs vs. Greens” Energy Game Show.



WIND TURBINE S.T.E.M. CHALLENGE



THE CHALLENGE:
How can a wind turbine blade be designed to achieve the highest electrical output?



In teams of 3 or 4 we designed wind turbine blades to try to generate the greatest electrical output.

We followed the engineering design process of brainstorming, designing, building, testing & evaluating, redesigning and then finally shared our solution.

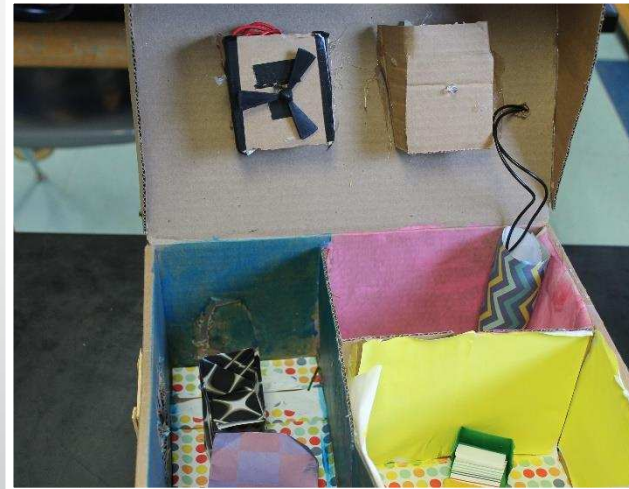
Our City Name Las Panelas



Solar homes created by our teams



Our Street Name- Lit Lane



SOLAR HOUSE S.T.E.M. CHALLENGE

Student teams of 3-4 were challenged to build a model solar house using a cardboard box. The house needed to use both passive and active solar heating. The active solar included a working ceiling fan and light.



We brainstormed names for our street and town. We created a Google Form and had all the members of our class vote on their favorite street and town name.

E.P.I.C. (*Energy Protectors in Our Community*) **Student Leadership Team**

The EPIC Team started their work in January. The team had many responsibilities:

1. Create & send "Save the Dates" and Posters to Advertise our Energy Expo
2. Assign responsibilities
3. Send Expo invitations
4. Prepare Bingo boards, Raffle tickets, Estimation entries and other Expo materials.
5. Set up and clean up for Expo events.
6. Create our PowerPoint and video submission



The EPIC Team will be:

1. Presenting at the Philadelphia Science Carnival in April
2. Sharing at the PEEP Innovation Challenge Showcase at the Franklin Institute in May



Energy Expo for three 5th grade classes from Oxford Valley Elementary School



We had many other guests in addition to the fifth grade guests- our district superintendent, our building principal, our assistant principal and Pennsylvania State Representative Perry Warren.



We taught the 5th grade students the energy chants we created so they would learn and remember more about Energy. We performed our chants with the 5th graders for the entire group at the Expo.



We shared our Energy Expo projects with the fifth graders and had them participate in an activity that we designed to illustrate our Energy Topic.



Students share their demonstration to show the visitors how their energy source works using the NEED models and supplies.

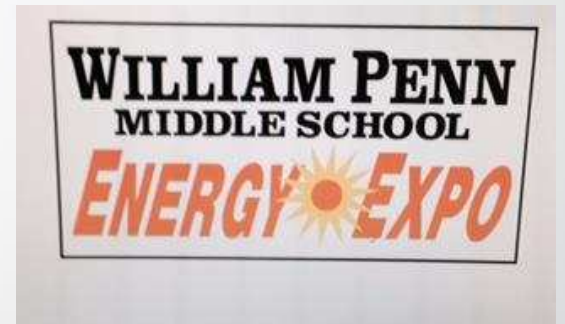


Barnes and Noble demos Tech Toys



Students share their knowledge about energy.

6th Annual Energy Expo and STEAM Fair at William Penn



Some students create their own models for the Expo.



6th Annual Energy Expo and STEAM Fair at William Penn

Expo visitors played Energy Bingo as they visited student displays. They participated in other make-and-take activities created by student groups. There was an Estimation Station where visitors guessed how many bottlecaps were in a reused pretzel tub and how many can tabs were in a reused soda bottle.

All Expo guests had a chance to win prizes just for attending our event. Over 15 community businesses donated gift cards, refreshments and other items to help promote attendance at our event.

Time we spent becoming ENERGIZED about Energy Education

ACTIVITY	# of students	Hours	Total Hours
Learning about the different types of energy	40	3	120
Learning about and Investigating Nonrenewable Energy Sources	40	6	240
Learning about and Investigating Renewable Energy Sources	40	24	960
Preparing for and running our Community Outreach Project	40	9	360
Learning about and Investigating Energy Conservation and Waste Disposal <i>(Trash Daddy & Wheelabrator Falls Partnerships)</i>	40	6	240
Participating in S.T.E.M. Challenges <i>(Wind Turbine and Solar House)</i>	40	7	280
APPROXIMATE TOTAL HOURS			2,220 Hours of Students Learning and Sharing with others about Energy