### WILLIAM PENN MIDDLE SCHOOL PENNSBURY ENERGY FORCE 2018-2019

#### **PROJECT SUMMARY:**

Fifty 7<sup>th</sup> grade students have been learning about energy and they are still investigating. Students learned about energy conservation and renewable & nonrenewable energy sources,.

After reading and learning about different energy and environmental topics we participated in many activities, community-based events and STEM challenges.
The goal of our **PENNSBURY ENERGY FORCE** was to take our newly acquired knowledge and act as energy ambassadors to educate our middle school community, the elementary students in our district, our parents and many other adult community members like the Superintendent, PA State Representative Perry Warren, School Board Members, local business representatives and local media.

Advisor: Mrs. Kristin Slota

December 2018-April 2019

### PENNSBURY ENERGY FORCE GOALS:

- 1. To learn more about NONRENEWABLE and RENEWABLE energy sources
- 2. To complete SCIENTIFIC INVESTIGATIONS to reinforce and enrich our knowledge about renewable energy sources and energy conservation
- 3. To complete STEM CHALLENGES using the ENGINEERING DESIGN PROCESS
- 4. To learn how to better **CONSERVE ENERGY** in our homes and school
- 5. To COLLECT DATA in over 200 locations in our school about energy usage and then analyze the data to identify areas where our school can better conserve energy
- 6. SHARE THE FINDINGS of our school's energy usage and then report our findings and share our RECOMMENDATIONS with our District's School Board and Superintendent
- 7. SHARE ALL OUR NEWLY ACQUIRED KNOWLEDGE with the Pennsbury School District Community







# Getting the Oil Out

After learning about nonrenewable energy sources. We were challenged to create a pipeline using straws and tape. We then used the pipeline to get the chocolate syrup to move up the pipeline.





### Investigating WIND ENERGY

Using Kid Wind Turbines and multimeters, student lab groups completed lab investigations to determine the number of wind turbine blades that would generate the greatest electrical output.



#### WIND TURBINE **CHALLENGE** How can wind turbine blades

highest electrical output?







Our teams used the skills of: BRAINSTORMING DESIGNING BUILDING TESTING **EVALUATING** REDESIGNING SHARING A SOLUTION

In teams of 3 or 4 we designed wind turbine blades using the ENGINEERING DESIGN PROCESS. Our designs were judged by 4 STEM teachers and the team that generated the most electricity won a Pennsbury STEAM shirt.

# Investigating SOLAR ENERGY

Student Lab groups used Solar Energy Kits provided by NEED to demonstrate how PV cells can generate electricity when exposed to a light source. Students also experimented with PV cells and UV beads outside the classroom.











### WILLIAM PENN 7<sup>th</sup> Annual Energy Expo & STEAM FAIR

Students use NEED models and energy carnival supplies to educate the event visitors about energy resources, lighting and conservation.





Students shared their knowledge about energy and their demonstrations with their parents, family members and other community VIPs during the EXPO on February 22, 2019.





7<sup>th</sup> grade students share their energy expertise with the 5<sup>th</sup> graders from our elementary feeder school.

### WILLIAM PENN 7<sup>th</sup> Annual Energy Expo



#### VIPs at the Community Outreach Event

William Penn students share their newly acquired knowledge with the District Superintendent Dr. Gretzula, Building Principal Chris Becker and PA State Representative Perry Warren.



## **ENERGY CHANT PEFORMANCES**





 William Penn 7<sup>th</sup> Grade students teach visiting 5<sup>th</sup> graders from Oxford Valley Elementary School theioriginal energy chants.

Groups of 5<sup>th</sup> and 7<sup>th</sup> grade students then perform the chants together for an audience of over 100 people.

Guests left our Expo unable to forget the catchy energy chants and engaging motions they were taught.





### **WILLIAM PENN BUILDING ENERGY AUDIT 2019**





During the late winter and early spring months the **PENNSBURY ENERGY FORCE TEAM has been working** to complete a huge challenge. This team of 20 students has been doing an energy audit of the entire William Penn Building. Student groups of 3 have been going to all locations in the build to measure and record data about air temperature, relative humidity, water temperature, light levels, and amount of watts used by electrical devices. Students wrote and delivered letters to ask permission to visit the locations and have been busy collecting data several times a week (while still completing the regular curriculum requirements) since their initial training with CEM Todd Rogers on January 23<sup>rd</sup>.



# Local Media Coverage

#### Inventiveness abounds at William Penn Middle School event



🐂 BUY 🔺 HIDE CAPTION

William Penn Middle School seventh-grader Omani DiPasquale explains the wind energy project she made with fellow seventh-grader Billy Clough during Friday's Energy Expo/STEAM Fair at the Lower Makefield school. [CHRIS ENGLISH / STAFF PHOTOJOURNALIST]



#### facebook

#### Rep. Perry Warren is on Facebook. To

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#### **Rep. Perry Warren**

Photos from Rep. Perry Warren's post in Timeline Photos ⋅ Friday at 5:56 PM ⋅ .

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### CLASSROOM EXTENSION to Exelun Renewable Energy Education Center



In January 50 students visited the Exelon Energy Education Center where we learned more about renewable and nonrenewable energy sources. We created models of a renewable energy source using Play-Doh, played an energy conservation game and built wind turbine models to test in the wind chamber. The Exelon experience helped us to better prepare for our Wind Turbine Challenge and our Energy Expo. We also learned more about saving energy in our homes when we played the "Hogs vs. Greens Energy Game Show.





# IMPROVING OUR TEAMWORK and LEADERSHIP SKILLS



Throughout our Energy Unit at William Penn this year our class had to WORK AS A TEAM to accomplish many tasks like our Wind Turbine Challenge and our Energy Expo. We have **IMPROVED AND PRACTICED OUR LEADERSHIP SKILLS** during our Expo and will demonstrate those skills again when we go to the PEEP **Innovation Challenge** Celebration at the Franklin Institute on May 28<sup>th</sup> and share our Energy Audit Project with other schools and STEM judges.

#### Hours logged by PENNSBURY ENERGY FORCE Team:

ACTIVITY	<b># OF STUDENTS</b>	HOURS	TOTAL HOURS
Learning about Nonrenewable Energy Sources	50	6	300
Learning about <b>Renewable Energy</b> Sources	50	10	500
Participating in STEM Challenges	20	6	120
Preparing for and Presenting our <b>Community</b> <b>Outreach Project- Energy Expo/STEAM Fair</b>	20	15	300
Learning about and Investigating <b>Energy</b> <b>Conservation</b> and <b>Waste Disposal</b>	50	5	250
Completing an <b>Energy Audit</b> of Every Room in our School (over 200 locations)	20	18	360
<b>Classroom Extensions</b> (Lincoln Financial Field-December, Exelon Education Center-January, PEEP Innovation Challenge-May)	20	8	160
APPROXIMATE TOTAL HOURS			<b>1,990</b> Hours of Students Learning & Sharing about Energy

# PENNSBURY ENERGY FORCE 2018-2019

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Team