

# Bureau Valley Storm-Manlius Elementary Electrifying Engineers



**Energizing Student Potential  
A STEM-Focused Energy  
Program  
NEED Project**

**Teacher Advisor**-Sheri Litherland  
**Students**-All 3rd -5th Grade  
Students at Bureau Valley-Manlius  
Elementary



Bureau Valley Storm  
Manlius Elementary  
Advisor-Sheri Litherland  
Teacher-Suzy Bell  
3rd-5th Grade Students

\*\*\*\*\*

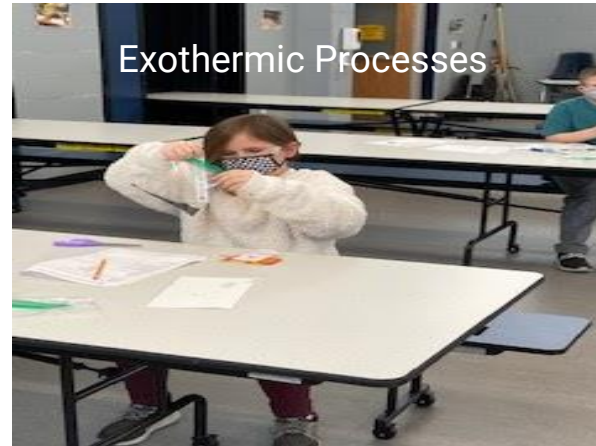
The Need Project along with the partners of the Energizing Student Potential Program have provided us with the needed tools to educate our students as well as our communities about the importance of energy education in order to create a better society for all.

Program Goals-

Goal #1-To learn more about energy and share some of our knowledge with the incoming third graders.

Goal #2- To challenge ourselves each and every time we complete an activity. Ask ourselves and others questions about the activity and learn to problem-solve as a team.

Goal #3- Share all that we learned with our families, school board members, and the different community members.



# Activities/Tasks.....Evaluation

## Activities/Tasks

1. **Marshmallow Shooters-Kinetic and Potential Energy (3rd, 4th, and 5th Grades)**
2. **Science of Energy Stations-Exploring endothermic and exothermic reactions (3rd Grade and 4th Grade)**
3. **Energy Efficient House Challenge (5th Grade)**
4. **Solar Car Challenge (4th Grade)**
5. **Solar House Challenge (4th grade)**
6. **Solar Energy-Greenhouse Project (4th Grade)**
7. **Virtual Family STEM Night**

## Evaluation

1. The students tested whether their hypothesis was correct or not by measuring the distance that their marshmallow traveled. They then figured the average distance of the small compared to the large marshmallow.
2. Complete the reporting forms for Science of Energy Stations.
3. How efficient was your home at maintaining its temperature? How did your cost for materials compare to the temperature change?
4. The students tested their solar cars to see how far it traveled. They then made modifications to their car and the solar panel that was attached based on the test.
5. The students tested their solar houses to ensure that the light and fan was functioning correctly.
6. The students observed and measured the growth of their plants.
7. The families enjoyed the STEM night and provided feedback through email.

# Marshmallow Shooters

Potential and Kinetic Energy



Hypothesis-I think the small marshmallow will travel the farthest.

# What was happening? Endothermic and Exothermic Processes

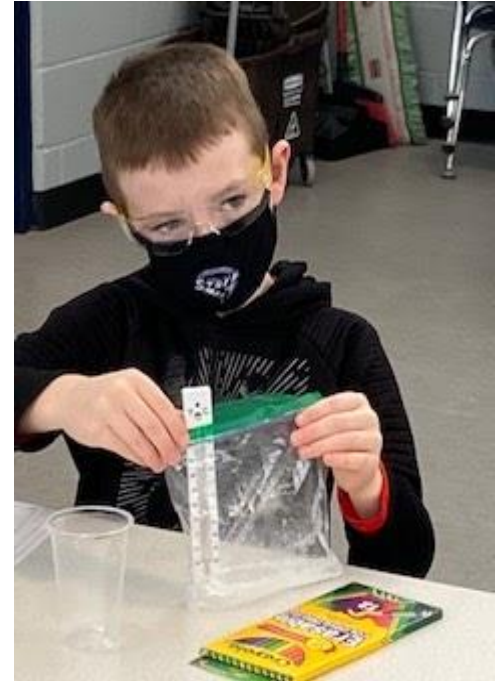


## Baking Soda and Vinegar

What happens to the temperature of vinegar when you add baking soda?



Hypothesis-I think the temperature will decrease.



# Endothermic and Exothermic Processes

## Calcium Chloride and Water

### Hand Warmers

What happened when calcium chloride and water were combined?



**Station Two Guide | ENDOTHERMIC AND EXOTHERMIC PROCESSES**

INITIALS	DATE	TIME	TEMPERATURE	INITIALS	DATE	TIME	TEMPERATURE
			90°F			130°F	145°F

**Section B (Clib Factors)**

1. Observe the "hot packet" of iron filings and record your observations.
2. Touch the bag and observe how the temperature feels to the touch.
3. Put a thermometer in the bag and record the temperature.

**in Data**

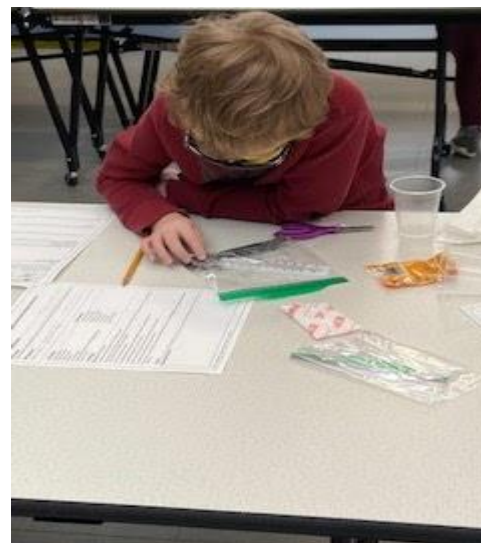
DEFINITION OF THE TERM:

LAB REPORT CHARACTERISTICS

**Part Three Calculations**

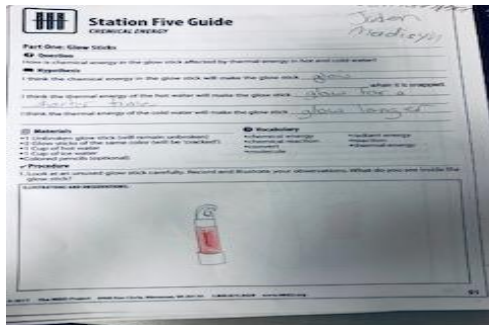
1. What happens to iron when it is exposed to oxygen?  
*It gets wet.*
2. Does this activity show an endothermic process or an exothermic process? Explain how you know.  
*It is exothermic because the water that we put with calcium chloride that was exothermic so this activity is exothermic.*
3. Does this activity show a chemical change or physical change? Use any data you collected to support your answer.  
*The answer is chemical because it is creating a substance.*
4. Why do you think the hand warmer is full of many small pieces of iron filings instead of one large piece of metal?  
*The reason we use more than 1 form is because it needs oxygen and a one big one.*

What happened when the hand warmer was exposed to oxygen in the air?



# Chemical Energy

How is chemical energy in the glow stick affected by thermal energy in hot and cold water?



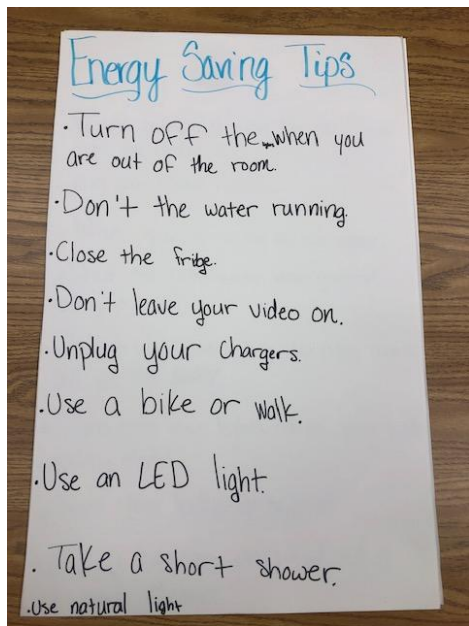
## Hypothesis

- I think the chemical energy in the glow stick will make the glow stick light up.
- I think the thermal energy of the hot water will make the glow stick brighter.
- I think the thermal energy of the cold water will make the glow stick not as bright.



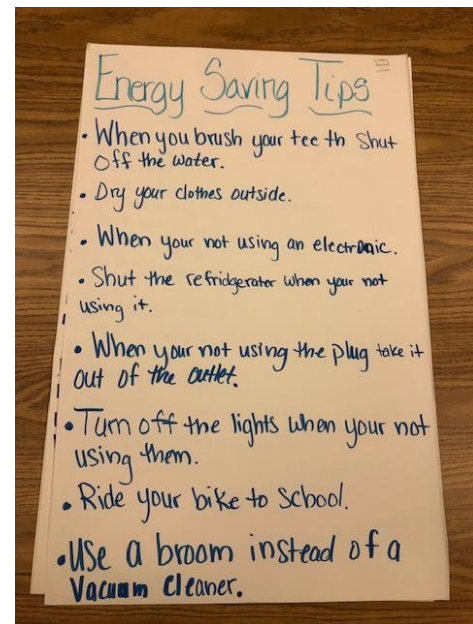
# Energy House Challenge

Students learned about energy efficiency, conservation, and economic returns by using various materials to insulate a cardboard house and then test its efficiency.



Cost Sheet

AMOUNT			TOTAL COST
2	Mailing Tape	@ \$0.50 roll	\$1.00
6	Plastic Film	@ \$0.25 each	\$1.50
	Aluminum Foil	@ \$0.20/meter	
4	Poster Board	@ \$0.50 each	\$2.00
	Bubble Wrap	@ \$1.00/meter	
2	Cotton Batting	@ \$0.75/meter	\$1.50
1	Padded Paper	@ \$0.50/meter	
20	Caulking	@ \$0.01/cm	\$0.20
10	Weatherstripping	@ \$0.01/cm	\$0.10
Total Cost for Materials:			\$6.20



What materials will most efficiently insulate your energy house?

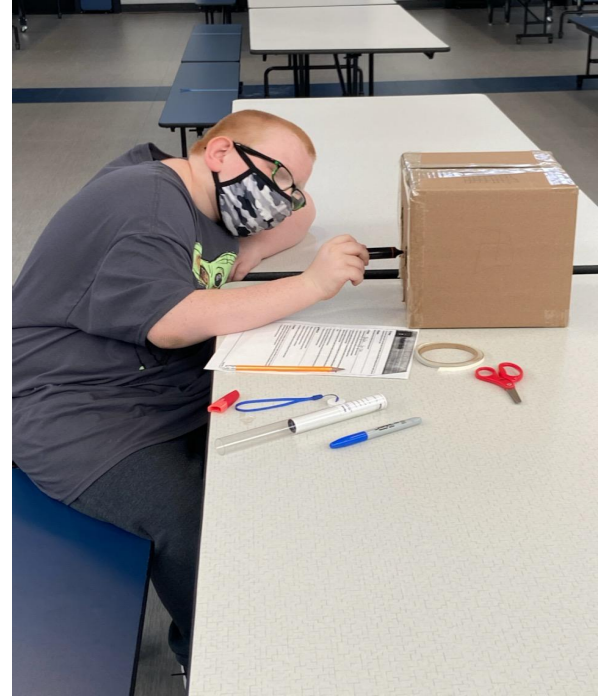
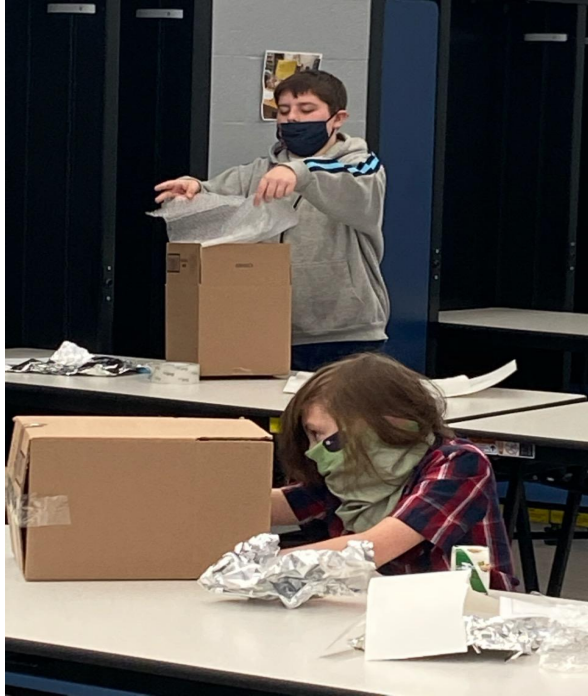


# Energy House Challenge

Creating and Testing

Room Temperature-70 Degrees Fahrenheit

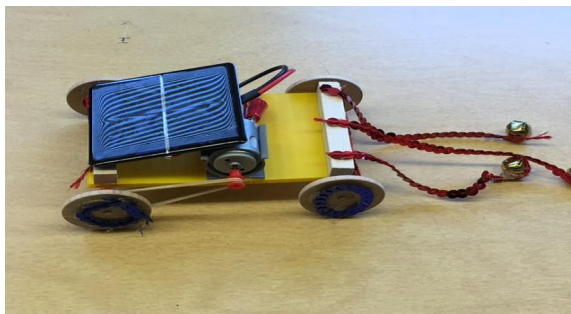
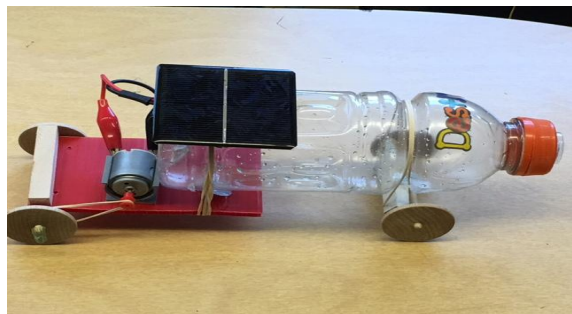
Lowest House Temperature-62 Degrees Fahrenheit



# Solar Car Challenge

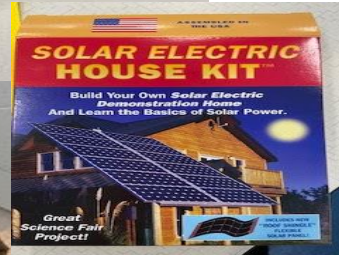
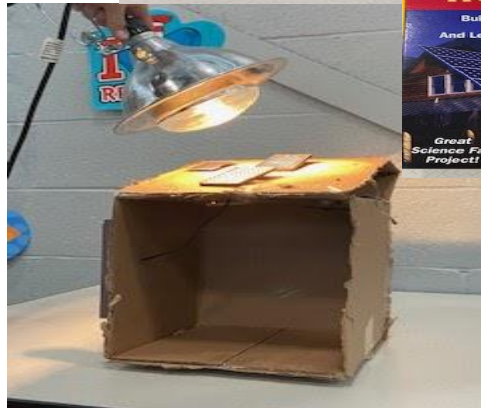
How far will the solar car travel?

## Solar Power in action!



# Solar Energy House Challenge

The solar panels provide enough energy to power the light bulb and the fan.

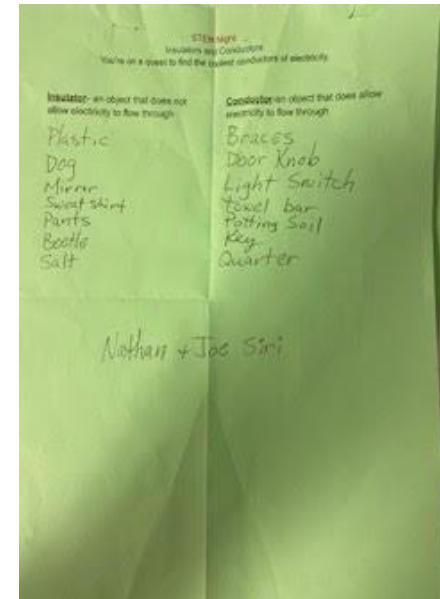
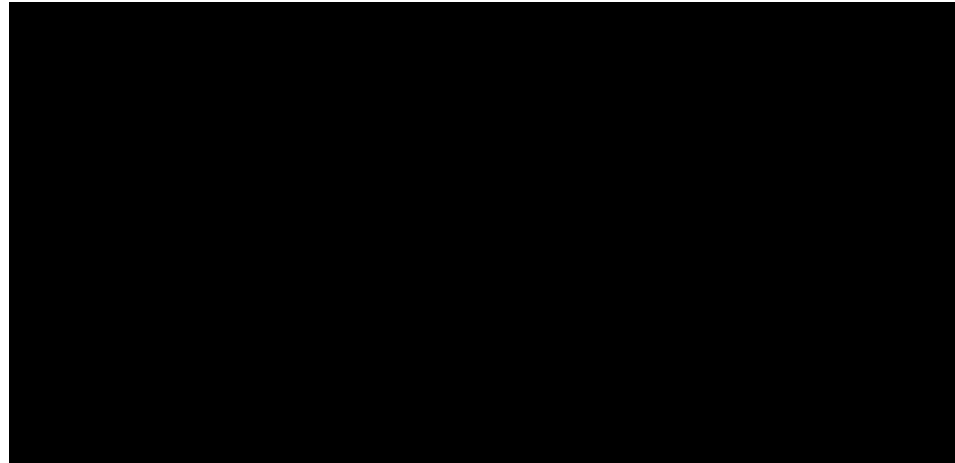
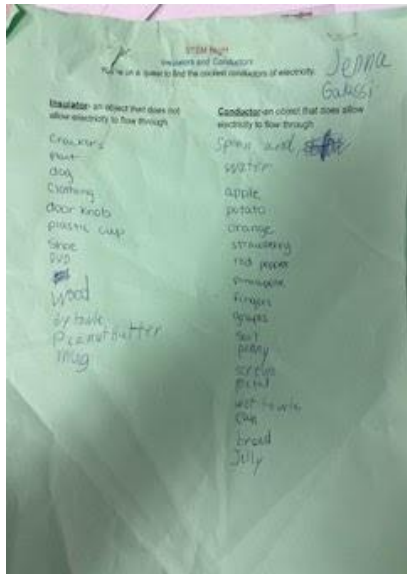


# Solar Energy-Greenhouse Project

Our class discussed how greenhouses use solar energy to heat up the greenhouse and trap the heat inside. We all noticed it right away when we got inside of it. We have planted vegetables (lettuce, cucumbers, radishes, etc.) and flowers (cosmics, petunias, marigolds, etc.).



# Virtual STEM Night- March 24th, 2021

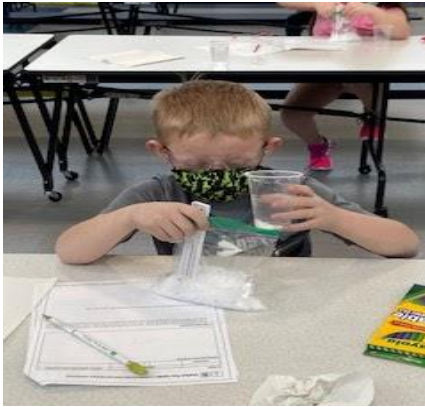


We were on a quest to find conductors of electricity in our house.

# Recycling is our job!



# Thank you!



Exelon Foundation.



PEOPLES GAS®  
NATURAL GAS DELIVERY

NORTH SHORE GAS®  
NATURAL GAS DELIVERY