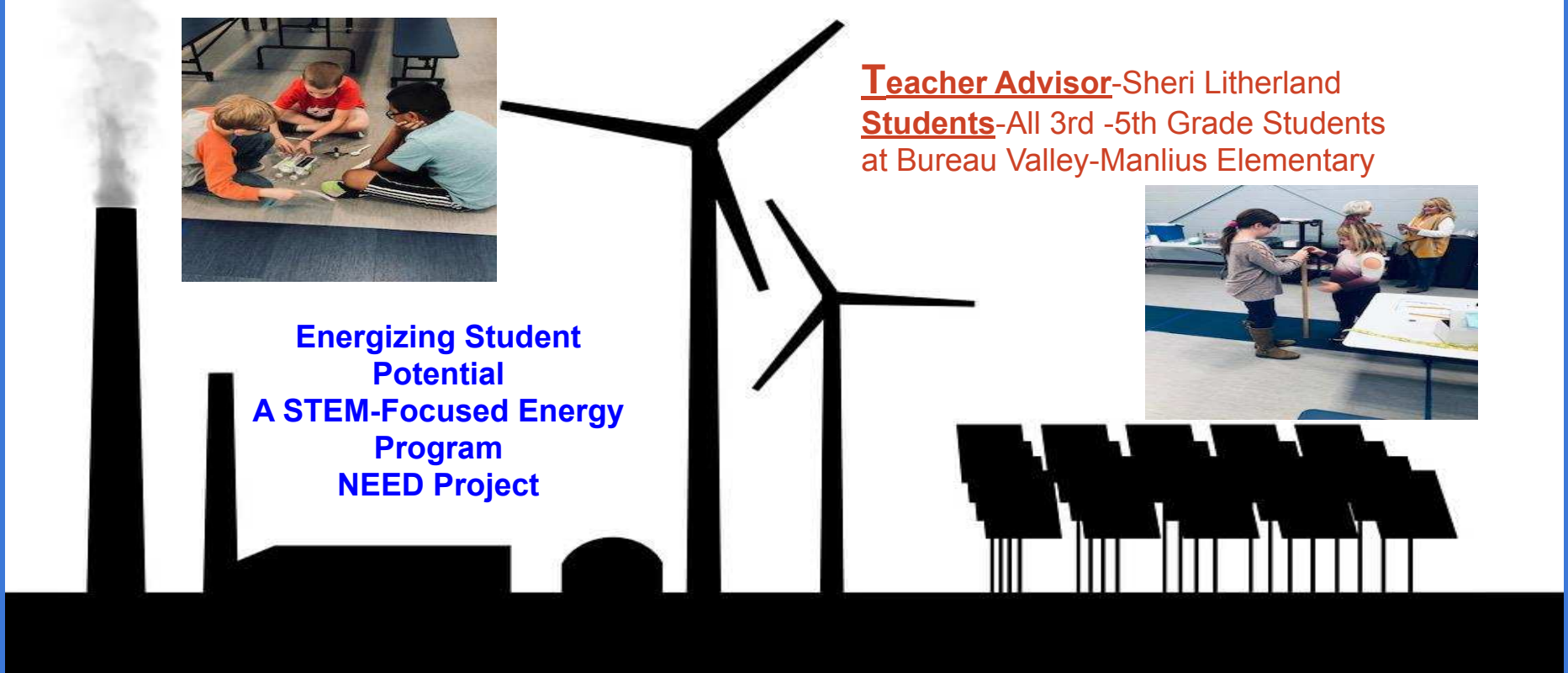


# Bureau Valley Storm-Manlius Elementary Energy Transformers



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





Kinetic and Potential Energy

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



Drilling for Oil

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

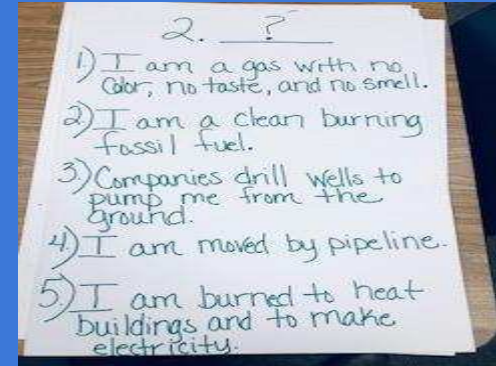
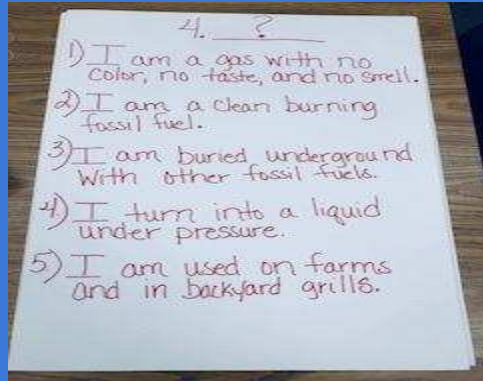
## Activities/Tasks

1. **Energy Sources BINGO and Energy Clues**
2. **Science of Energy Stations**
3. **Solar Bottle Boat Design Challenge and Testing**
4. **Conduct Energy Audit of School Building**
5. **Creating Wind Turbines out of Water Bottles-Powered by Solar Panels-Wind Farm**
6. **Electric Wind Turbine Cars**
7. **Host a Family STEM Night**
8. **Energy House Challenge**

## Evaluation

1. Identify the energy sources with the use of the clues.
2. Complete the reporting forms for Science of Energy Stations.
3. Test the solar boats to determine if the solar panel is at the right angle in order to power the boat.
4. Complete the energy audit paperwork with Tyler Cvitkovic and share findings with principal and other teachers.
5. How much energy does your solar-powered wind turbine produce?
6. How many blades does it take to get your electric car to move and are the blades at the correct angle?
7. How efficient was your home at maintaining its temperature? How did your cost for materials compare to the temperature change?

# Showing off what we know about energy and the sources of energy!





# The Science of Energy Investigations



How does thermal energy affect a bi-metal bar?



**A Chemical Reaction Occurred!**

When the baking soda was added to the vinegar, the temperature decreased.



How can a solar panel power everyday items?



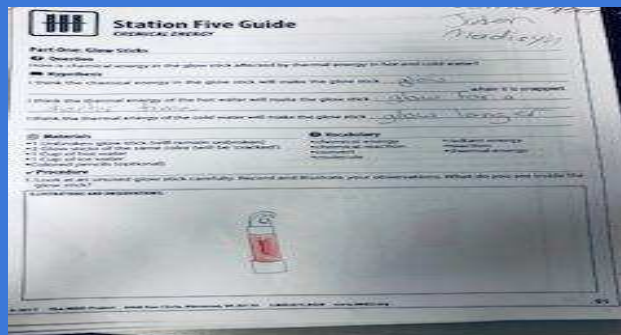
### The Apple Battery

How will an apple produce electricity with different metals?



### Glow Sticks

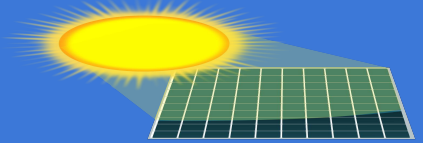
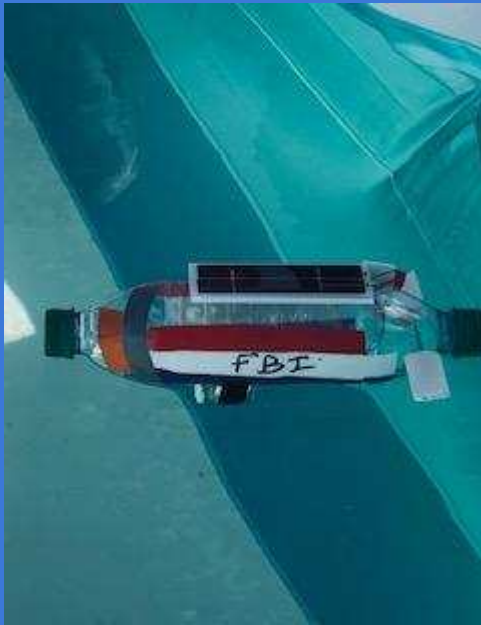
How is the chemical energy in the glow stick affected by thermal energy in hot and cold water?



What energy transformations take place when you stretch and release a rubber band multiple times?

Hypothesis-I think the thermal energy of the hot water will make the glow stick glow for a shorter time. I think the thermal energy of the cold water will make the glow stick glow longer. -**Student Example**

# Solar Bottle Boat Challenge



Which vessel will be the quickest and most maneuverable? Will the shape and size of the bottle you choose have an effect on the overall performance?





# Student Audit Recording Form

Name: 2-25-20 Date: 12-25 Student Telephone: 252

Customer Location Number: 50 Location: old and dirty

Is the location within 100' ☒ Yes ☐ No ☒

Neighborhood of the building within city: 65th

What time does building open: 10:00 am

What is the business: restaurant

Can you find any air vents in the building? ☒ Yes ☐ No

Are there any vents that can be obtained for the customer? ☒ Yes ☐ No

If yes, are they connected to: ☒ gas ☐ refrigerant or air

Number of Outside Vents: 1 ☒ gas ☐ refrigerant

What is the type: AC unit ☒ gas ☐ refrigerant

Is there Temperature of Return: 72.6 ☒ Refrigerant reading: 71.8

Is there: NO

Leakage of any diffuse gases or gases: Bad grass tires softball field

Turn on the system and read cooling coil test water is observed

Test Water Temperature: 100.2 Length of time for test Water: 10 minutes

Are there any warning labels? NO

Lighting Type: FLUORESCENT

Light Meter Reading: 41.2

Can the lights be observed? ☒ Yes ☐ No

Can some lights be turned on and some left off? ☒ Yes ☐ No

When the lights are when you observed the location? ☒ Yes ☐ No

When the lights are when you observed the location? ☒ Yes ☐ No

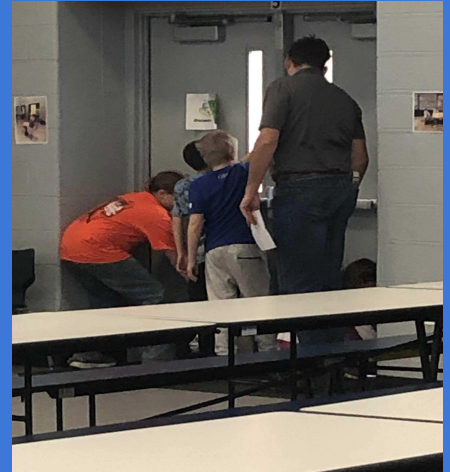
Are there warning labels (lighting) ☒ Yes ☐ No

Are there warning labels (lighting) ☒ Yes ☐ No

Name: 2-25-20 Date: 12-25 Student Telephone: 252

# Energy Audit with Tyler Cvitkovic

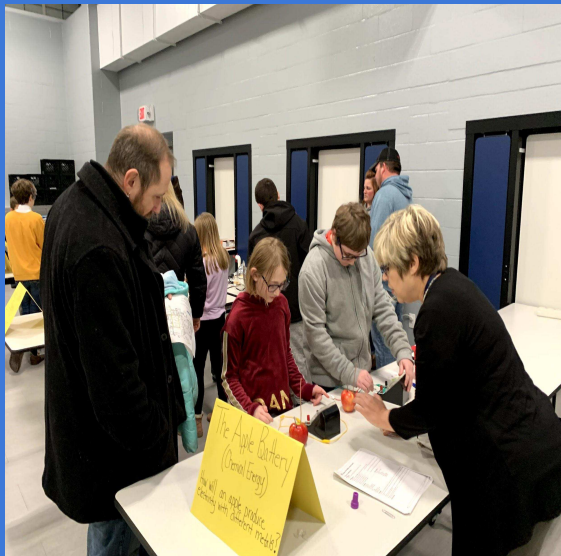
Students examined how we are using energy throughout the building, from our heating and air unit to our lights. They also discussed different cost-saving measures that we could implement to help save on energy.





# Family STEM Night February 12th, 2020

Students took the lead as they demonstrated and shared some of the different things that they have learned.



# Electric Wind Turbine Cars and Solar-Powered Wind Turbines





# 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.**

## Energy Saving Tips

- Turn off the when you are out of the room.
- Don't the water running
- Close the fridge.
- Don't leave your video on.
- Unplug your chargers.
- Use a bike or walk.
- Use an LED light.
- Take a short+ shower.
- Use natural light

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

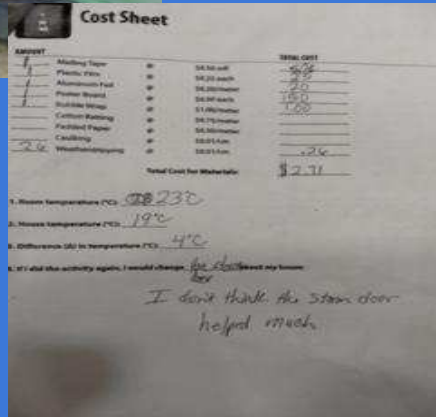
## Energy Saving Tips

- When you brush your tee th Shut Off the water.
- Dry your clothes outside.
- When your not using an electronic.
- Shut the refrigerator when your not using it.
- When your not using the plug take it out of the outlet.
- Turn off the lights when your not using them.
- Ride your bike to school.
- Use a broom instead of a Vacuum cleaner.

**What materials will most efficiently insulate your energy house?**



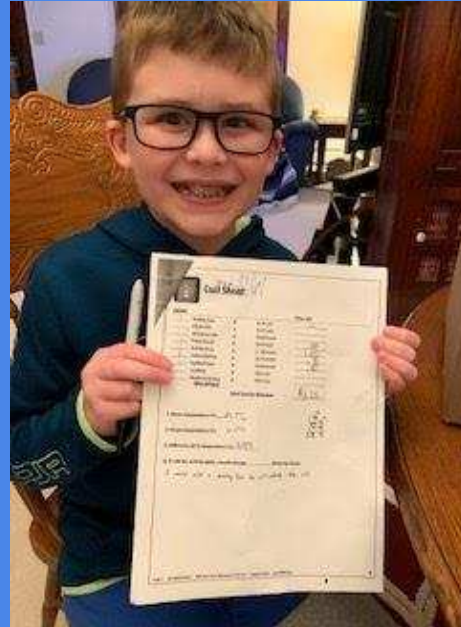
Families volunteered to take on this challenge and finish the project with their student.



# Rocking our Energy Challenge at Home!!

Difference in Temperature-8.9 degrees Celsius

I would add a ceiling fan to circulate the air in my house.



# Composting and Recycling



The students are all actively engaged in our recycling program within our school. The students make sure that recycling is taking place in all areas of the building. It is the students job to collect recycling materials on a weekly basis.

This is the first year that our students have been involved with composting. We would like to thank Mrs. Nichols for involving us in this project.





Bureau Valley supports  
renewable energy!



Thank You!



Exelon Foundation.

ComEd



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