Short Line School Engineer Energy Kids

Learning Through Teaching Others!

Advisor:
Leslie Lively

Through our hands on learning we wanted to share that as many people (kids and adults) as possible. Once we learned about energy, we took our knowledge out to the public and taught them all about energy. We really wanted to take our learning on the road, you know those "Country Roads"! Before we could do that, we had to learn the information, we started in the classroom.

Once again, we used our social media on Instagram and Twitter to reach out to people so they would know what we were doing in the community.

Goal: Learn about electricity, magnetism and force and teach others in the community.

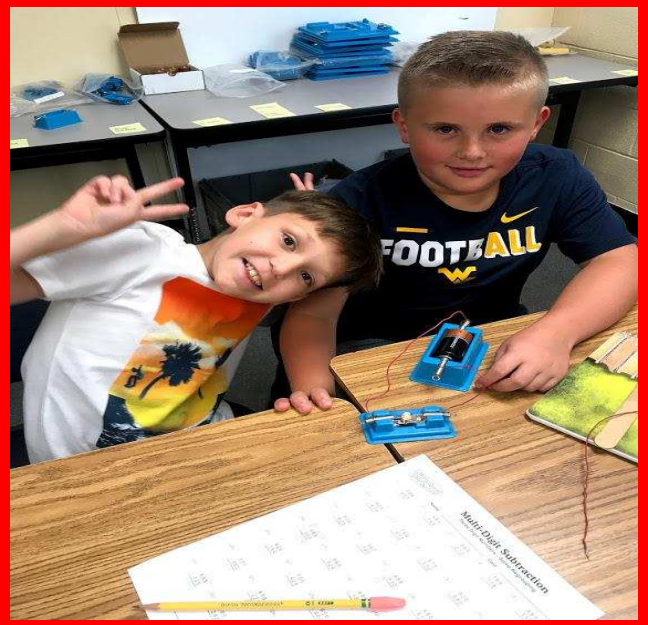
Activities: We first learned about energy, electricity, and magnetism from our NEED Elementary Info books. Mr. Lively likes for us to find things on our own because it makes it more memorable for us. By using our motto: "In Learning You Will Teach, and in Teaching You Will Learn." he then allows us to work with other groups to find new ways to get the job done. As you can see in our pictures we learned a lot about energy using the NEED Project kits.

It's always fun in Mr. Lively's class because we get to do tons of hands on activities. It's not just book work. He challenges us to think on our own. We also challenge each other which helps us all learn.

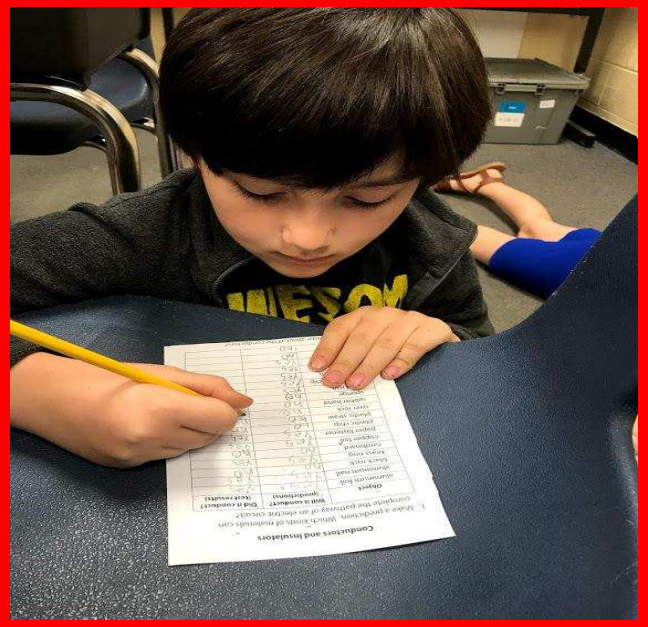
Resources: NEED Elementary Info Book, FOSS Kit, internet

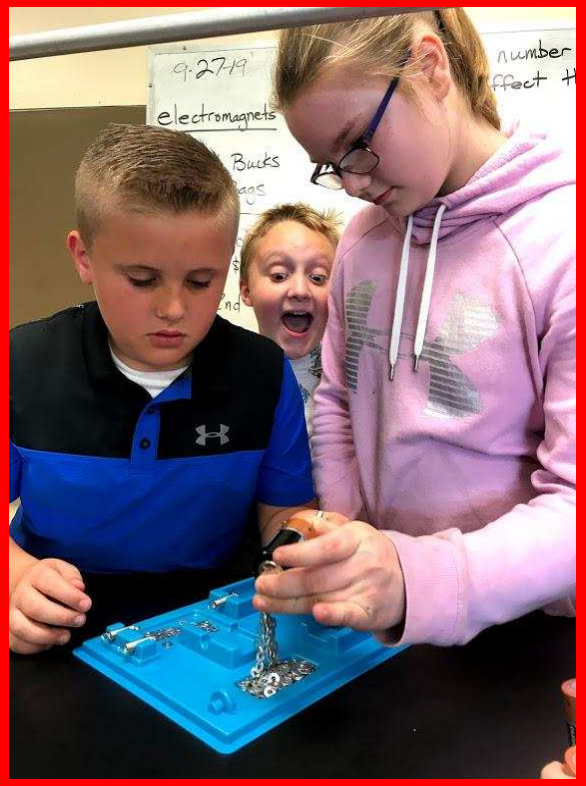
Leadership: We explored on our own to find ways to light the bulb and then we were able to teach others. We worked with teammates to help each other build large parallel circuits around the room that met Mr. Lively's challenge standards that he wrote on the board each day. By working as a team we were able to get about 95% of the challenges completed.

Evaluation: We were given a pre and post-test on general terms of electricity, magnetism and force. We also were given a hands-on challenge that each person had to complete in front of Mr. Lively. That challenge consisted of making a series and parallel circuit as well as making an electromagnet that would pick up at least 30 washers. Mr. Lively would give us a short quiz after each of the stations take make sure we were able to understand the process.



We learned about how circuits are built. Once we learned about a series circuit, we were then challenged to build a parallel circuit. We then learned all about insulators and conductors. We went around the school to discover more insulators and conductors.





Learning how to build an electromagnet and then having a competition to see which team can pick up the most washers. After we collected data in our trials, we found that if you wrap a copper wire around a rivot 45 times it picks up the most.

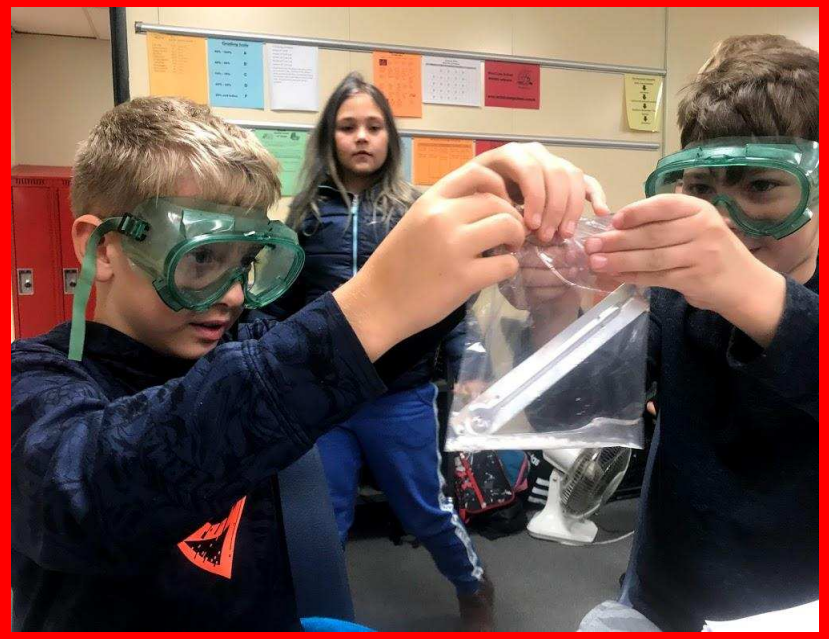
Goal: Learn about potential and kinetic energy, endothermic/exothermic, radiant energy, chemical energy, thermal energy, and electrical energy.

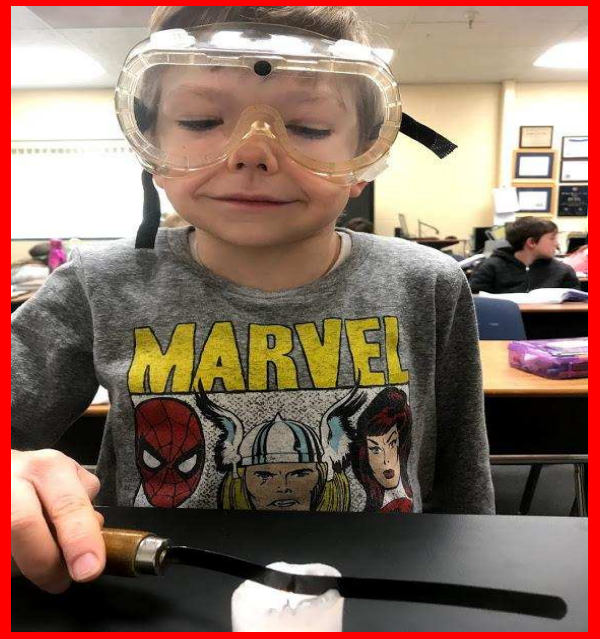
Activities: By using the NEED Project Science of Energy kit we were able to understand the concept more clearly. As we worked our way through the six stations we slowly learned about the forms of energy. Of course hands on activities from the NEED Science of Energy kit the demonstrations made it easier to remember the different forms of energy.
We also designed and tested coasters on the JASON Learning site to explore potential and kinetic energy further. On the site we were able to make adjustments to our coaster in order to make it perform better.

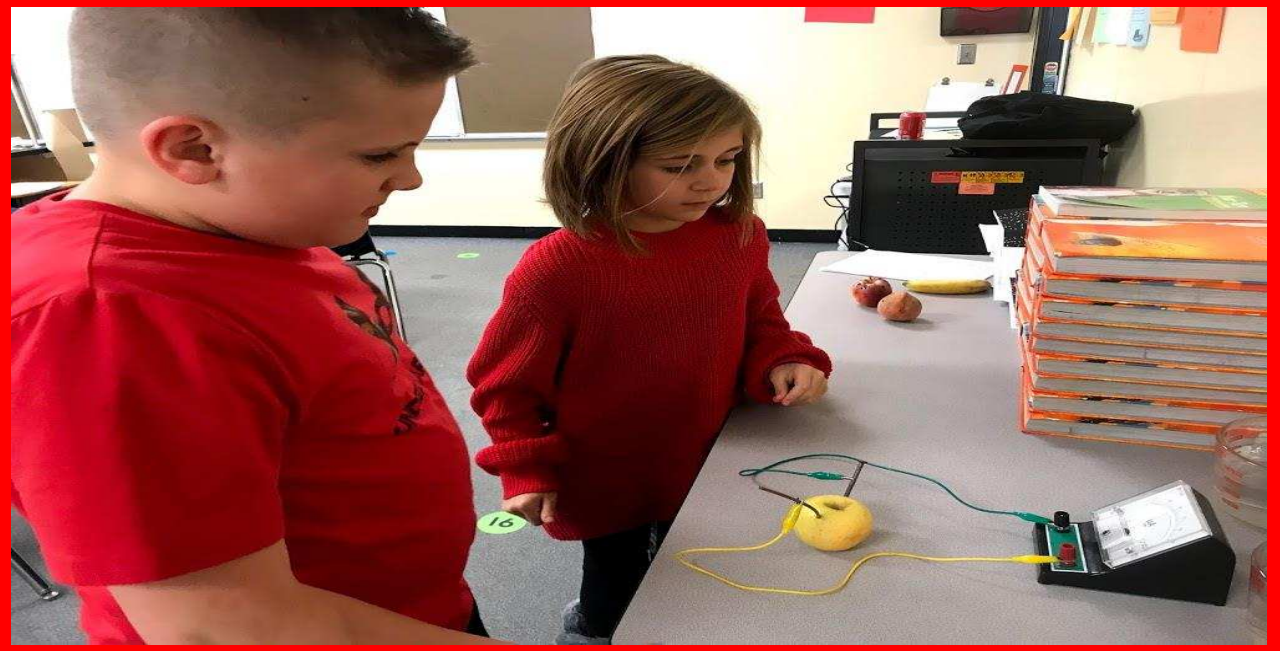
Resources: Science of Energy Kit from NEED, JASON Learning, FOSS kits

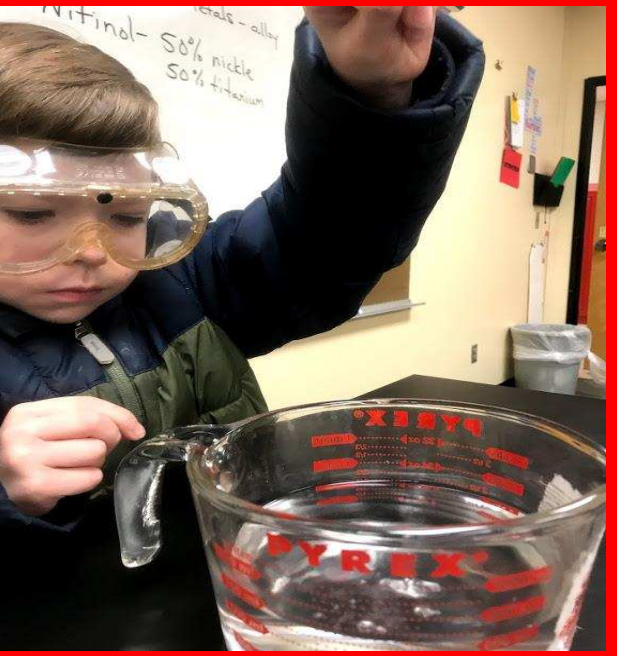
Student Leadership: We worked in teams as we rotated through the six Energy Kit stations.

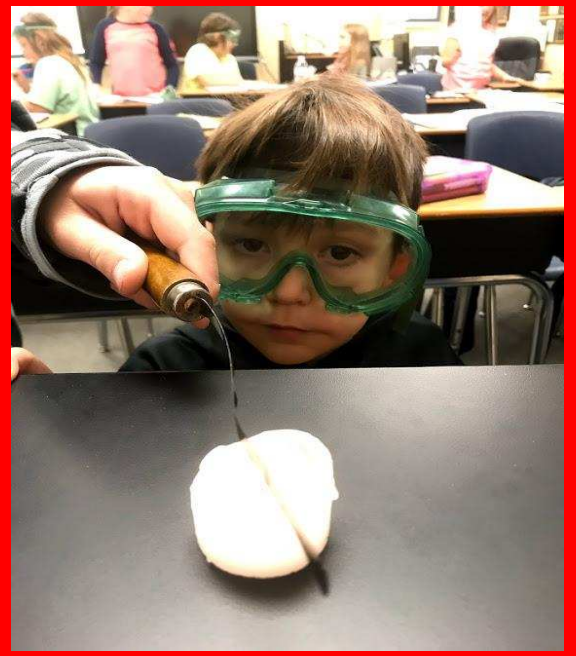
Evaluation: We had to write about what we learned from the NEED Project Science of Energy Kit as well as labeling the forms of energy for each of the stations on a test.

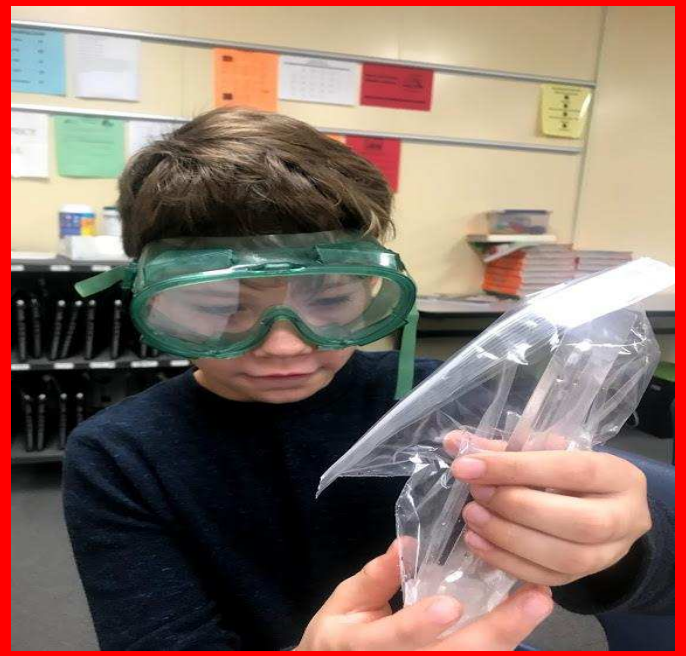


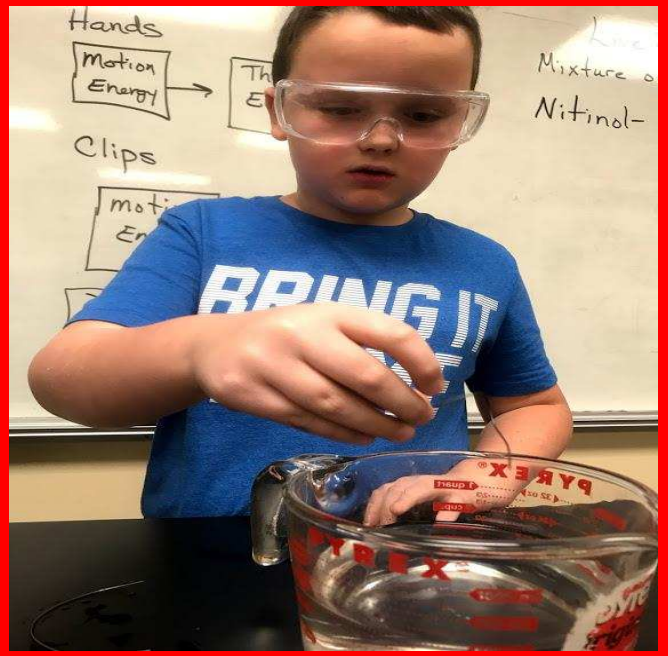





Nitinol- 58% nickle
50% titanium
PYREX






Hands
Motion Energy
Clips
Nitinol-
BRING IT
PYREX

Goal: Learn to engineer a wind turbine as needed to increase the amount of electricity it can produce.

Activities: After learning about wind energy from our NEED Elementary Info Books we took on the challenge to make the best wind turbine. Once we gathered our materials, we started making our first set of blades, oh did we mention we had to use recyclable materials! A small wind tunnel in the classroom for use to test our wind turbine blades in. We then recorded our data on the excel spreadsheet. We then had to document the size, shape, spacing and pitch of our blades. Once that was recorded in our science notebooks, we could then make adjustments to our blades and retest.

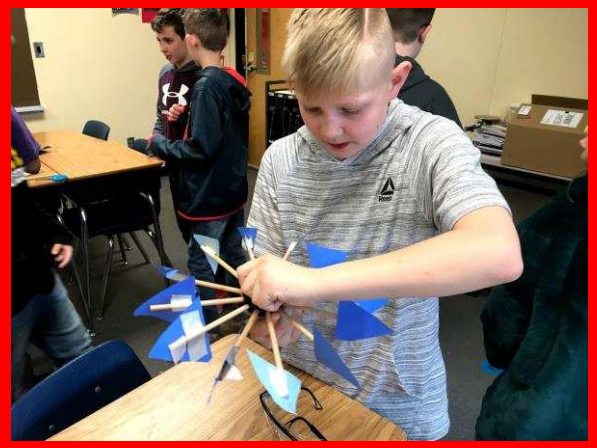
After each round of testing and documenting size, shape, spacing and pitch we were able to fine tune our blades thus allowing them to produce more electricity. We soon realized that sometimes just a small adjustment to the blades would make a big difference. By documenting each change were able to see how the adjustments affected the turbine and production of electricity.

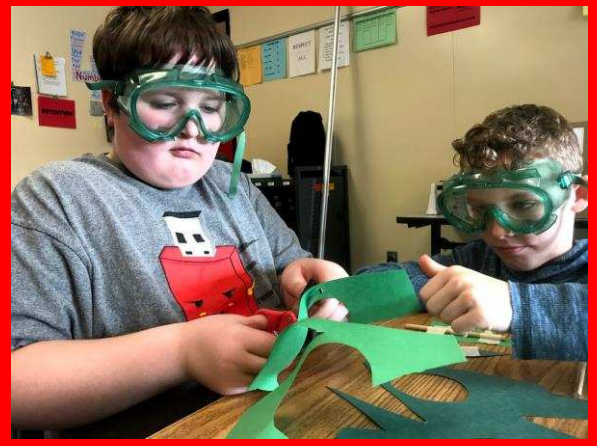
Resources: NEED Elementary Info Book, NEED wind turbine kit (Wonders of Wind), Internet, Twitter, Instagram, JASON Learning

Leadership: Students worked with classmates to engineer blades and complete testing and documentation.

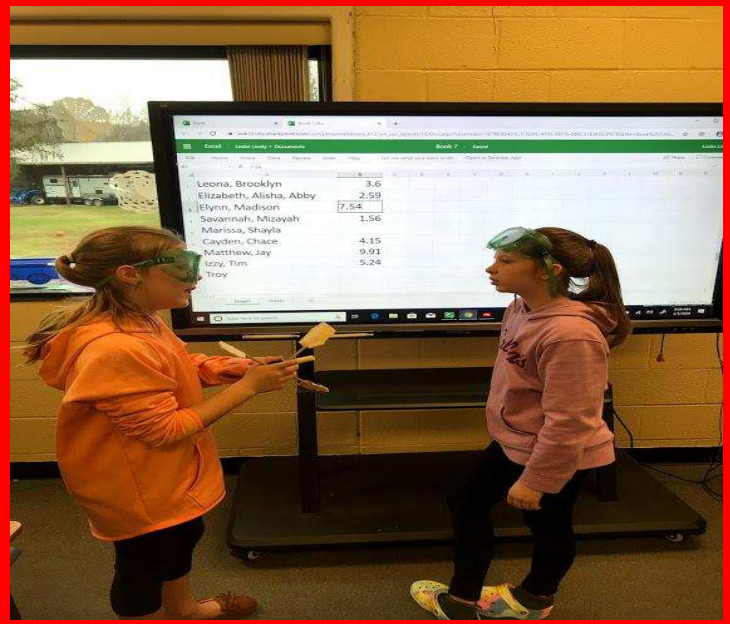
Evaluation: We were evaluated on our ability to improve our production of electricity through our data collection. We had to prove that we were making our blades produce more electricity on the turbine. We were also scored on our record keeping in our science notebooks. Information had to be ABCD (Accurate, Big, Colorful, and Detailed). We have learned over time that a good scientist keeps neat records and can prove his/her work. Mr. Lively gave us a score as he observed us presenting to our classmates.

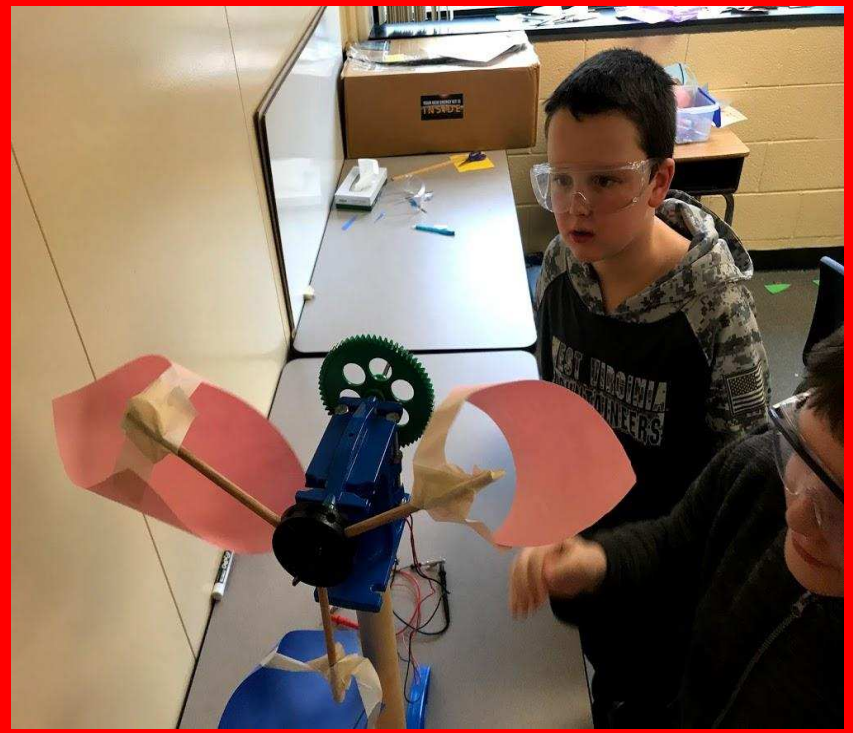
We learned how wind turbines make electricity. We had a class competition to see whose turbine could produce the most electricity. While assembling the wind turbines, we discovered each blade needs to be spaced out evenly and tilted the same angle to catch the most wind, which resulted in more electricity being produced.






Jon, Hailee
Dylan, Lindsey, Logan
Wyatt, Devin, Keaton
5.13
Carley, Kednora
4.63
Space


Leona, Brooklyn
3.6
Elizabeth, Alisha, Abby
2.59
Jelynn, Madison
7.54
Savannah, Mizayah
1.56
Marissa, Shayla
Cayden, Chace
4.15
Matthew, Jay
9.91
Izzy, Tim
5.24
Troy




DETENTION
BE BOLD
be Brave
Be Kind

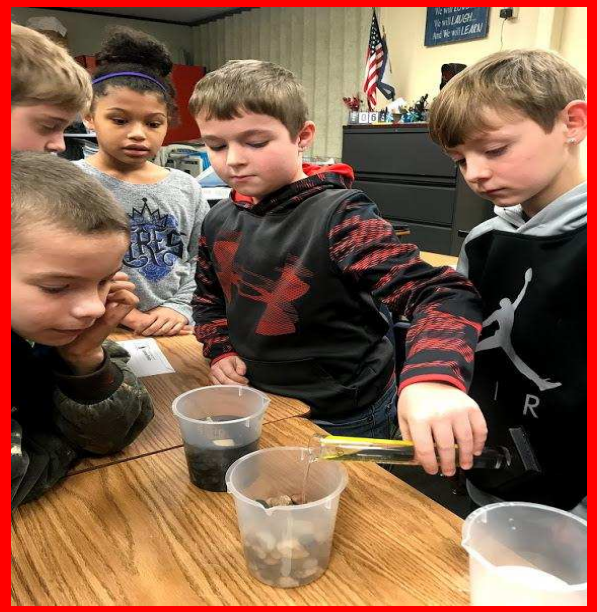
Goal: Explore Oil and Natural Gas.

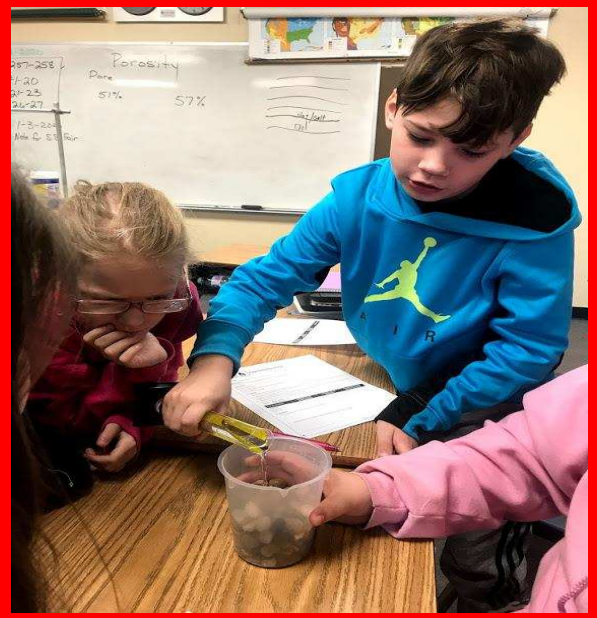
Activities: We had the opportunity to learn about the processes of how oil and natural gas is formed, found and produced by using the NEED Project Exploring Oil and Natural Gas. We learned about density, porosity as well as viscosity. We learned a lot about how fracking is done underground in order to get the oil and gas out of the shale. We were scheduled to tour our local Dominion Gas facility but Covid-19 cancelled that field trip.

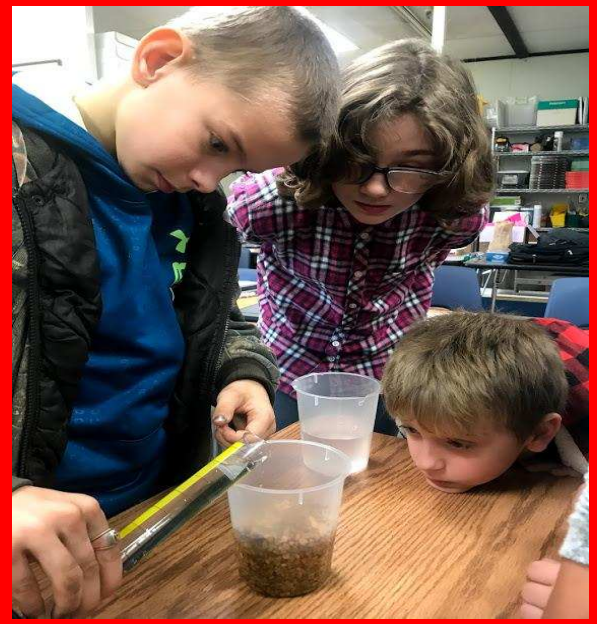
Resources: NEED Project Exploring Oil and Natural Gas, MPLX Gas, Dominion Gas, Internet, Twitter, Instagram

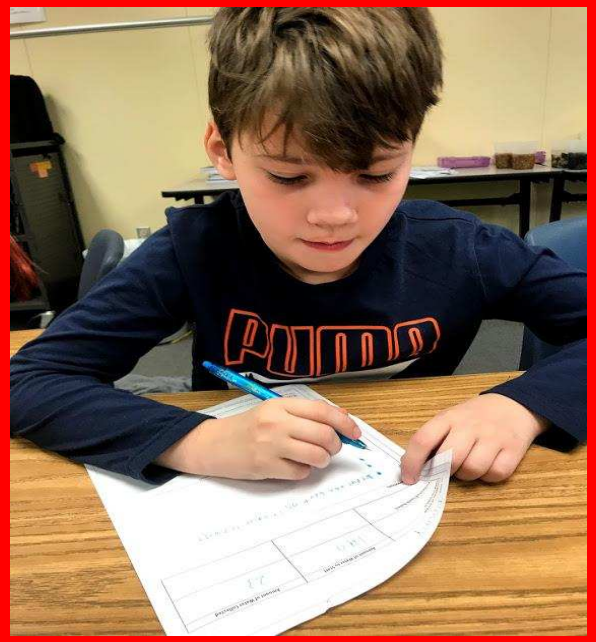
Leadership: We were able to help each other work through the steps in each of the lessons. Through encouragement we were able to complete each of the lessons.

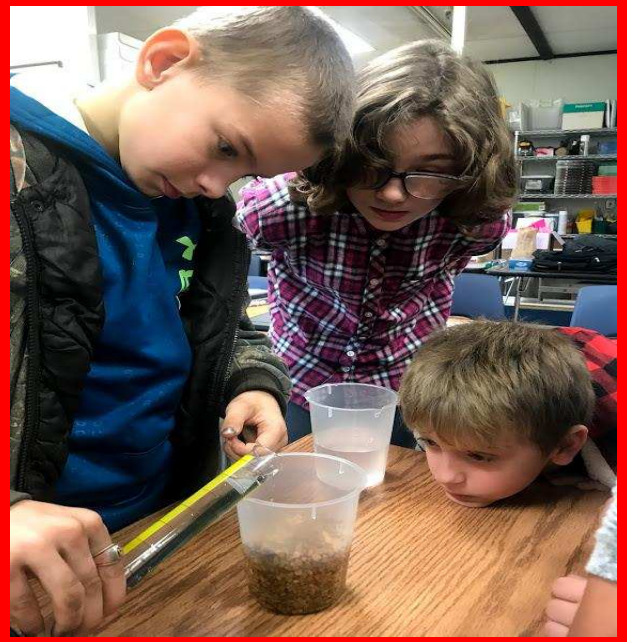
Evaluation: We were graded on our ability to complete each lab and worksheet that came with it. We were also graded on our explanation of what we did in the lesson to Mr. Lively. He also gave us a score as he observed us presenting to our classmates. Mr. Lively likes to fishbowl (stand behind us and look over to see what we are doing).

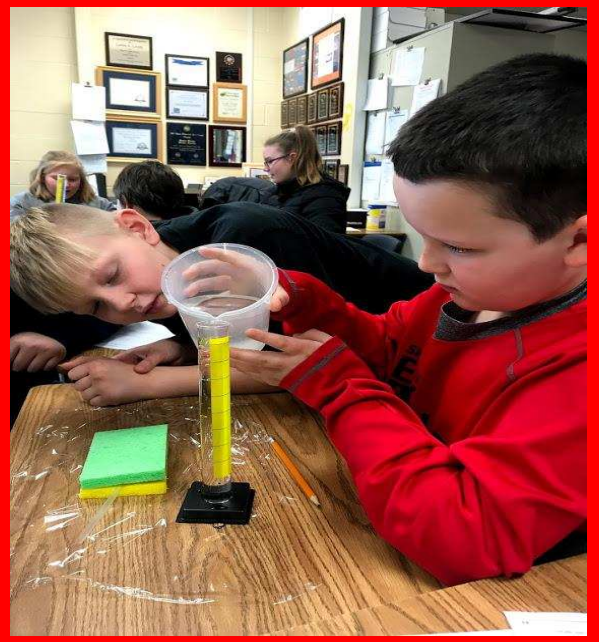


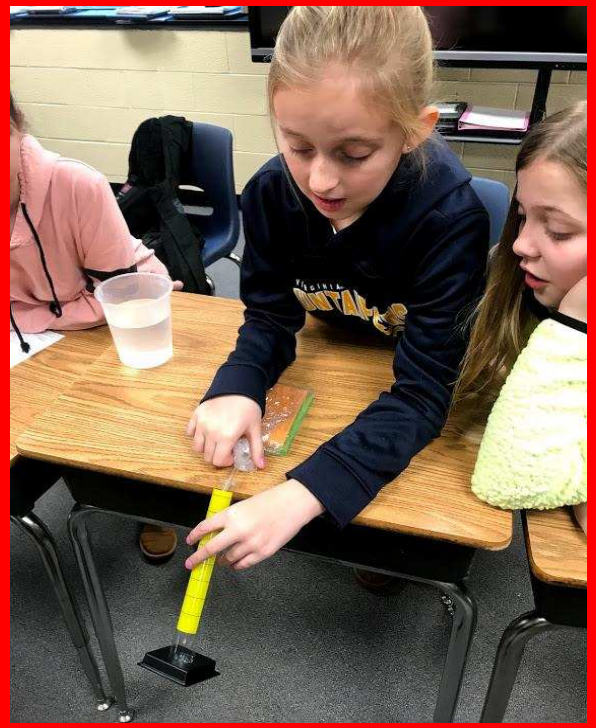


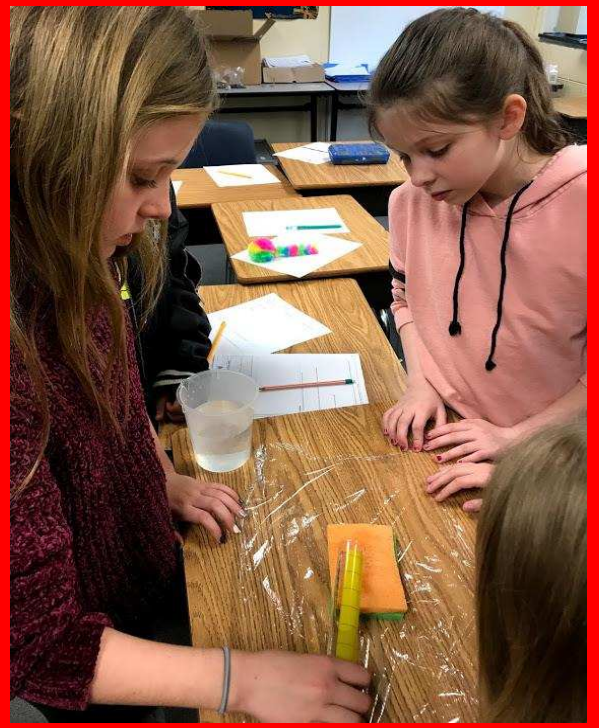


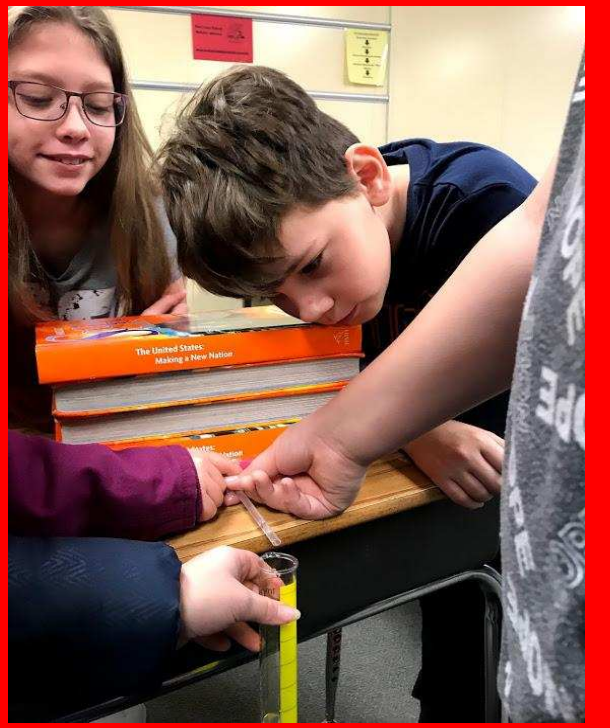

PUMA










The United States:
Making a New Nation

In this class activity, we were learning how to get oil or natural gas out of the ground. We used a cup, straws, tape, and everyone's favorite, Hershey's syrup! While performing this activity, we discovered the further the resource is in the ground, the more difficult it is the bring to the surface.

Goal: Present to the Community

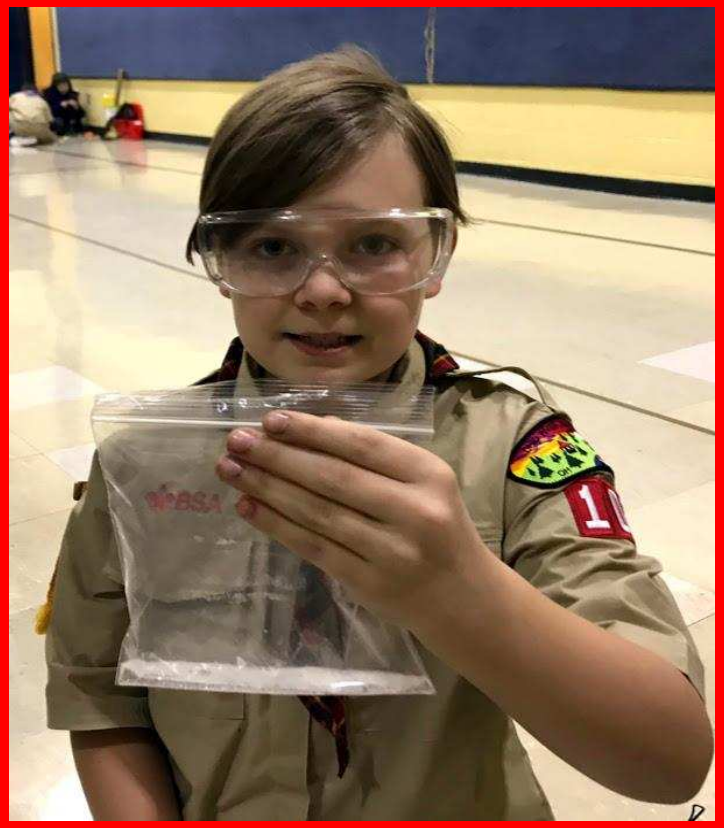
Activities: We wanted to show the community what we have learned so we presented at our Cub Scouts Pine Wood Derby and the West Virginia Regional Pine Wood Derby. We also taught many people at our fundraisers (Festival of Trees and Quarter Auction)

Resources: NEED Project Science of Energy, Wind Turbine, Cub Scouts (local and Regional)

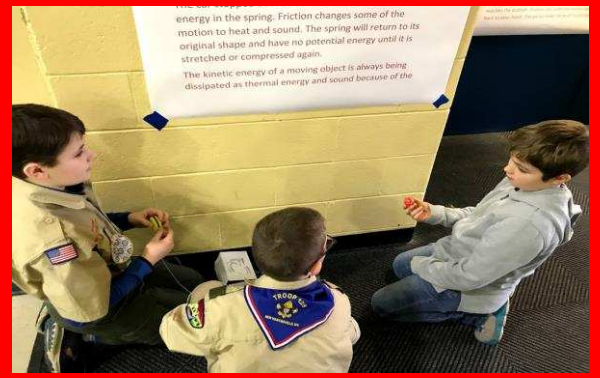
Leadership: Students helped lead the activities and answer any questions that participants might have. Students helped organize the event and set up the different areas to prepare for families to come in. Students also helped advertise the event.

Evaluation: We evaluated ourselves by the number of people that visited us during the demonstration.


ANNUAL
PINEWOOD DERBY
MOUNTAINEER DISTRICT
PRE-STAGE
STAGE
RACE
ONE WAY




energy and how energy transforms from one form
another. Toy Car How did the toy car store energy
toy car has a spring in it. When you pushed down
car and pulled it backwards, you transferred your
energy by compressing the spring. When the car is
released, the car starts to move. The elastic energy
spring changed to motion. Why did the car stop movi
The car stopped because of friction
energy in the spring. Friction cha
motion to heat and sound. The
original shape and have no poten
stretched or compressed again.
The kinetic energy of a moving
dissipated as thermal energy


energy in the spring. Friction changes some of the
motion to heat and sound. The spring will return to its
original shape and have no potential energy until it is
stretched or compressed again.
The kinetic energy of a moving object is always being
dissipated as thermal energy and sound because of the

After all the classwork and experiments, the Short Line Engineer Energy Kids set out to inform the community about energy facts. We demonstrated the activities to help educate individuals on the importance of energy and answer any questions they might have.