



Continuing to Build a Brighter Future

Energy Education Revolutionized
Oakwood High School
Heidi Steinbrink

This year we continued our theme from last year and wanted to see what we could do to advance the growth of our club. We wanted to further improve the kids knowledge about energy which means a brighter future for our club, the community, and the world. To achieve our goal, we continued to attend many youth outreach days, we are in the construction phase of our solar cell phone charging station, making curtains out of recycled energy team shirts, and we added new outreach activities to help grow our mission of continuing to build a brighter future.

Solar Eclipse

Goal: To learn about the cause of a solar eclipse and study the impact of solar eclipses on solar panel performance. We assisted in counting out all the glasses needed for our entire Jr and Sr High to go out and experience the eclipse.

Action:

1. Students created data tables for one of two experiments: Temperature change over time and solar panel output performance throughout eclipse.
2. Collect Data during the eclipse
3. Analyze data

Evaluation:

We were able to look at the performance of the solar panels and see a slight decrease in performance during the eclipse but even at the darkest point for the eclipse, they were still outputting power. We also noted at most a two degree temperature change during our experimentation. This was a great way to jump start the year with energy! 750 students in our school participated in the eclipse and 110 collected data during the eclipse.



Fundraising

Goal: Raise money to fund our projects and activities throughout the year.

Action: We held two fundraisers to meet our goal.

1. During the holiday season, we sold candy canes to Oakwood students. After buying materials and creating signs for the fundraising, we designated our selling and delivering times for the candy grams
2. Our team is planning to participate in an Earth Day fundraiser by selling snacks and beverages to the Oakwood community.

Evaluation:

Our fundraising was very successful this year. We raised approximately \$150 so far this year. We also plan to use the money we raise from the Earth Day fundraiser to fund more of our solar charging station.



Recycled Curtains

Goal: To make the classroom more energy efficient and to recycle shirts to promote energy conservation and Energy Team.

Action: We all have t-shirts that we have collected over time and so this year some of our members are putting their sewing skills and old shirts to use. By cutting up old Energy Team, OEP, and NEED shirts, we are making curtains to help retain heat lost by the energy inefficient windows in our classroom. Team members have designed the curtains to be able to grow each year since the windows are so large. The remaining t-shirt scraps are being turned into woven baskets and given to the community.

Evaluation: This shirt curtains are in process and the goal is to have them installed for Earth Day! It will be interesting to be able to complete some temperature comparisons next winter to test their efficiency! More science to come!



Leadership Training Day at Wright State University

Goal: Prepare our new membership for future outreach days and to teach our members important leadership qualities.

Action:

1. Visit Wright State University
2. Go on a tour of the campus to gain insight into programs and campus life after high school
3. Go through different leadership and team building exercises
4. Learn how to teach the many energy stations

Evaluation: Training day helped our new members bond with our veterans, while learning all about energy education. Utilizing resources from OEP as well as NEED, our members learned about new energy stations and concepts to bring back and share with the rest of the team. It was also very interesting to tour the campus and learn about programs we may pursue after high school. Nine team members participating in the training and brought back the material to the rest of the team to prepare for our 5th grade science day.



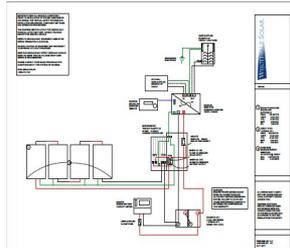
Solar Phone Charging Station

Goal: To build a solar phone charging station that can be utilized throughout the school year as well as special events in the community.

Action: This project has four major components:

1. Research solar system options --Completed 2016-17
2. Find and secure grant funding for *Getting Charged*--Completed 2016-17
3. Properly build and wire our solar system--In Process 2017-18
4. Develop educational resources to teach our community about solar power and how our station works. Completed 2017-18
5. Develop future lessons on determining power output based on location and angle of panels. Completed 2017-18

Evaluation: *Getting Charged* is still a work in progress but we have achieved Part I, II, IV and V of our action plan. We secured funding through grant writing from the Oakwood Schools Education Foundation, we utilized professionals in the field utilizing Oakwood Energy Team alum, Ian Munn, as well as experts at wholesalesolar.com. We have received a system that will allow us to grow and expand our original idea from a single charger to multiple charging ports and that will have both a permanent mount on the school building roof with one mobile panel and cart to take into the community for outreach. Two energy teams students are working on the project with the support of our engineering teachers. The great news is that aside from the portable charging station, the project has expanded with permanent mounting on the roof to power Mrs. Steinbrink's lights in her classroom as well. This has been a passion of our team and although the progress is slow the process has been entirely student driven and designed.



Boy Scout Night

Goal: Impact our community by teaching energy concepts and sustainability to the younger generations and helping thirty Cub Scouts earn their Scientist belt loop.

Action: Five team members worked the event.

1. Examine the Boy Scout requirements to earn their Scientist belt loop.
2. Determine stations and materials needed to teach activities
3. Create shopping list and pack stations
4. Teach stations at Boy Scout night.

Evaluation: Twenty eight Scientist belt loops were earned through our activities and we were also able to educate parents and siblings doubling our impact for the evening. Sixty people were reached through this program. The boys enjoyed learning about circuits, Bernoulli's principle, energy transformations, energy transfer and density, to name just a few activities.



Dayton Regional Science Festival

Goal: Impact our community by teaching energy concepts and sustainability during the Dayton Regional Science Festival at the Boonshoft Museum of Science.

Action: To work the Dayton Regional Science Festival by:

1. Determine what activities would be appropriate based on the ages of attendees.
2. Pack and prepare all of our teaching materials.
3. Set-Up the materials at the event.
4. Teach concepts of energy transformation, power, energy conservation and efficiency utilizing the energy bike.
5. Teach concepts including electromagnetic spectrum, infrared technology, heat conduction and transfer as well as energy transformations using the infrared camera.
6. Teach simple series and parallel circuits using snap circuit kits as well as electric sticks.

Evaluation: Two team members assisted approximately 562 students, teachers, and families from across the Miami Valley to learn from our three demonstrations using the energy bike, circuits, and infrared camera. Building on OEP materials and NEED infobooks.



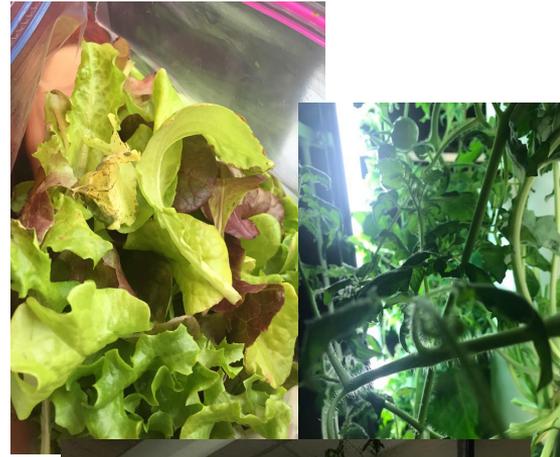
Hydroponic Tower

Goal: Implement sustainability practices we have researched and model them in our school and community to help us work to a sustainable future.

Action:

1. Clean out and empty what remained of last years plants
2. Plant a new round of crops of various types of plants (lettuce, spinach, etc)
3. Maintain the crops and check the water level regularly
4. Harvest the lettuce and donate it to the cafeteria and local food pantry

Evaluation: We have had success with our tower as our continuous rounds of crops were harvested. This year we worked with a special education classroom and assisted the students with learning the science behind the tower. The students monitored daily the plant growth and took measurements for their science class. We taught them about monitoring the pH and solution levels to ensure prime growing conditions during our lunch meetings and invited in a speaker from the company to present on the benefits of the tower. Our tower has allowed us to involve the entire student body by donating the produce to our cafeteria and getting more students interested in the work that we do. We are extremely excited to make more donations to the local shelter this summer! This project reached well over 800 students and staff.



STEM HOOPLA CHALLENGE

Goal: To work in conjunction with DP&L to provide an Energy Room to teach concepts in energy efficiency and energy forms.

Action:

1. Work with DP&L to determine what equipment and stations to teach.
2. Pack stations
3. Teach stations in Thermal Imaging, Sound, Circuits, and Energy Transformations at the Hoopla Event.

Evaluation:

The event brought in 1,250 students and many more parent or chaperones. This was a high traffic and fun event built around STEM in the Dayton Region as part of the Road to the Final Four and the play in games for the tournament that are here in Dayton each year.



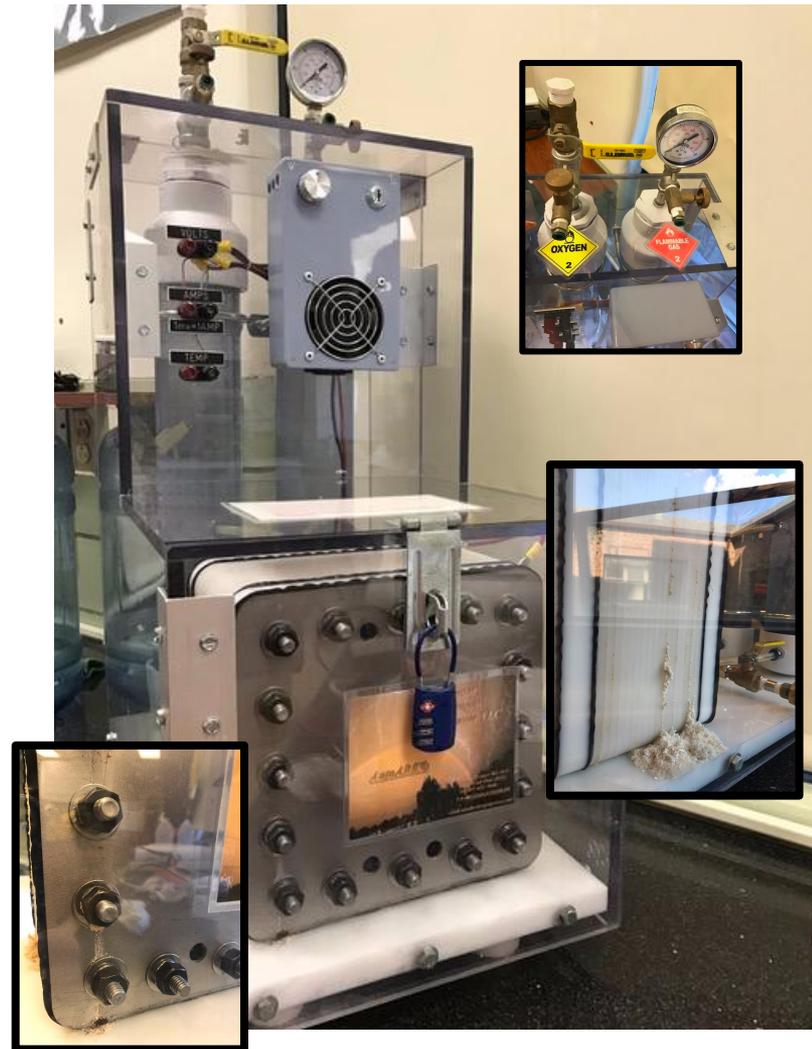
Hydrogen Generator

Goal: Implement sustainable practices and model them in our school and community

Action: Work with our Hydrogen Generator and Solar Panel to

1. Work with local CEO of Millennium Reign Energy LCC (MRE) to work on upkeep and redesign of the Hydrogen Generator.
2. Examine design flaw in bolt type and learn how engineers redesign/re-engineer an existing product.
3. Return our Hydrogen generator to operational status using our solar panel.
4. Continue to create and store Hydrogen to have a club cookout on our modified grill.

Evaluation: This is a work in progress. We have made contact with Millennium Reign and are waiting to visit the facility and work with their staff on the redesign. We are excited to be able to use the generator in the future in coordination with our phone charging station at community events.



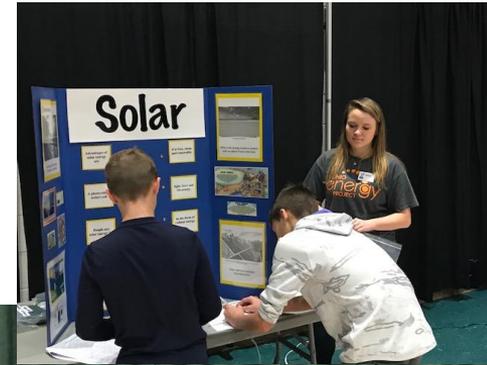
WRIGHT STATE DAY

Goal: Impact our community by teaching energy concepts and sustainability to the younger generations.

Action: The team took the following action steps:

1. Train members on the station/s that they would teach at Wright State Day
2. Practice stations prior to Wright State Day using NEED and OEP resources
3. Pack materials and help OEP staff with set-up and tear down at event
4. Execute assigned stations at Wright State Day
5. Excite students about energy and energy conservation

Evaluation: Nine members of our team, along with other local high school teams, came together at Wright State University to provide elementary students the opportunity to learn about energy. This was a great event to educate younger students about energy in a fun, interactive, and educational environment using NEED and OEP materials. The teachers involved were able to take our content and demonstration ideas back to their own schools. In the end, we impacted over 300 students with our teaching and indirectly impact the entire Miami Valley with the media coverage of the event.



Earth Day Drive Electric Event

Goal: Work to help support the local Drive Electric Dayton (DED) group as they hold a free EV Ride and Drive for local residents on Earth Day.

Action:

1. Secure tables and concession items to sell at the event.
2. Support the event group.
3. Pass out reusable green grocery bags provided by Energy Team.
4. Work with DP&L to secure giveaways for the event.

Evaluation: We will evaluate and reflect on the event after it occurs. We are excited to host this event at Oakwood this year and to see the new technologies ourselves. They will have a number of Electric cars there to ride in including: Chevy Volts and a Bolt, Teslas, BMW i3s and more! We will also work to have some of our stations out for younger children to enjoy and perhaps our Energy Bike as well.





Since one of our goals was to reach out to the youth of our community, we made it a priority to become visible on the media to promote our club.

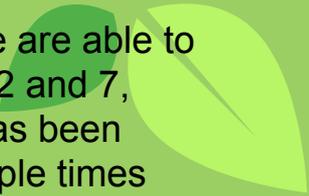


Educational Outreach

BRIGHTENING THEIR FUTURE



1,080,044 people are able to watch Channels 2 and 7, which our club has been featured on multiple times throughout the year.



CONTINUING TO...



Energy Education Revolutionized

Over this past year, we have worked hard to create new and more inventive projects and we feel as though our team was successful in our endeavours. Not only have we left projects that can be built upon in the next few years, but we have inspired kids around our community to become aware of the importance of energy efficiency. By taking our knowledge from the past and using it in the present with the youth we were able to work with, we are now confident that after this year, we have left our mark on the community to

BUILD A BRIGHTER FUTURE!!!