

# Improving The World Around Us

Oakwood High School  
Energy Team  
Advisor: Heidi Edwards



# A Year of Growth...

This year we wanted to continue our educational outreach and focused on sustainability and changing habits to secure a greener future. We wanted to further improve younger students 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 & community outreach days, built and completed our solar cell phone charging station, placed 25 sensors around our school and collected data for an energy audit. We have added a more environmental and clean energy focus this year as well. In October, we spent all morning cleaning up a local trails through Five River Metroparks. We also have now started to collect and sort all of ours school's paper, plastic and can recycling every Thursday as well as printer cartridges for our district. On Earth Day, we will hand out 250 reusable grocery bags at our local grocery store, and we have drawn plans for a new hydroponic garden for our high school. This has been our busiest year yet with **724+ hours** spent on projects and we are excited to see how we will continue to grow and leave a greener, more sustainable Earth for the next generation!

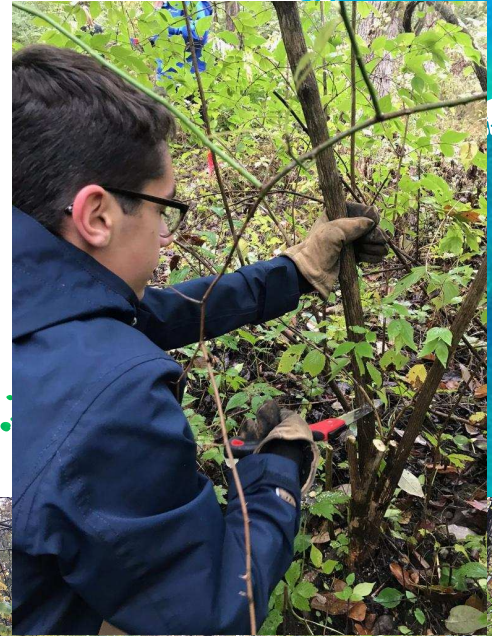
# Trail Cleanup

**Goal:** To give back to the community through trash pickup and trail clean-up/conservation, while working for a more sustainable environment.

**Action:**

1. Make contact with the park to volunteer & organize team members
2. Get equipment from park ranger and follow her to work site.
3. Work to clean section of trail from 7 AM to 11 A.M moving all of our debris and trash to their designated areas.

**Evaluation:** This cleanup was a complete success. The ranger was blown away our work and welcomed us back anytime. All members that attended had a great time and felt as though they had made an important contribution by donating **30+ hours** of labor for the initiative.



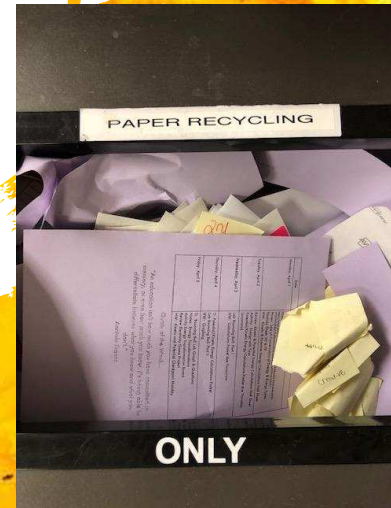
# Recycling

**Goal:** To positively impact the environment by promoting, and carrying out a recycling service at Oakwood Junior and Senior High School.

## Action:

1. Painted trash cans were placed in every room of the school which caught the attention of students and reminded them to recycle rather than throw away trash.
2. Collected paper, plastics, and any cans during lunch every Thursday. Then we separated the items into different dumpsters, for the city of Oakwood to collect and continue the recycling process.

**Evaluation:** This was our first year collecting recycling, so it was a big task to accomplish! However, we have been able to fully implement a schedule to effectively retrieve all of the Junior & Senior High recyclables for almost 1000 people. We also have been able to train many of the new members of our club on what to collect and separate so that the recycling will continue for many years to come. Each week we collected an average of 5 cans of paper (160 gallons) and 4 bags of plastics and cans (128 gallons). Over the 40 week school year adds up to **6400 gallons** of paper being recycled and **5120 gallons** of plastics & cans being recycled. With 8 students recycling an hour each week, members will have worked **320+ hours** recycling this school year!



# Recycling Printer Cartridges

**Goal:** To positively impact the environment by promoting, and carrying out a recycling service for printer cartridges for the Oakwood City School District.

## Action:

1. Promoted and communicated with all six buildings in our district how to correctly recycle printer and ink cartridges.
2. Set-up a district drop off site in Mrs. Edward's room.
3. Established an account with Evolve Recycling
4. Profits obtained will be reinvested back into the Energy Team for future projects.

**Evaluation:** This is an ongoing recycling program for our entire district. We have sent out **8** cases of printer cartridges this year alone with approximately **25** cartridges per box. That means we have saved **200+ cartridges** from going into landfills with more to be recycled! Members have worked **5 hours** to complete this recycling project.



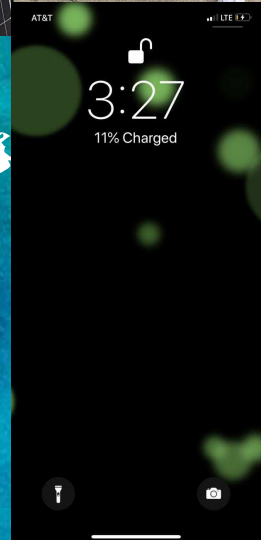
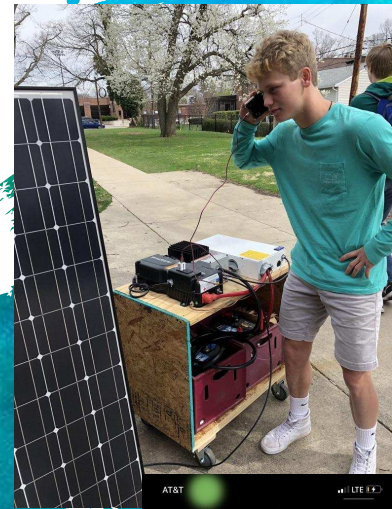
# Solar Panel Project

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

**Action:**

1. To complete the entire solar charging station and make it portable.
2. To have a functioning solar phone charging station to take out into our community.
3. To showcase our charging station at our community That Day In May event--a highly attended community event that most all of Oakwood citizens attend.

**Evaluation:** This has been a three year project for us. In year one, we completed research and secured grant funding to cover the purchase of all of the hardware to utilize in the project. In year two, we worked with a local engineer to begin the setup and build of the system. This was a labor intensive process and we had to learn a tremendous amount of information and draw up prints for building the cart as well as schematic diagrams for approval prior to construction. This year, we have a functioning solar cart! We are finishing the last stages and will have the cart in service at our community That Day in May event. Next year we will continue to work on our project and will add solar panels to the roof of our building to drive the operation of the charging station in Mrs. Edward's classroom when it is not out in the community. We even think we can take the lights in her classroom off of the grid and run them entirely on solar! This has taken over **100 hours** of service to complete!



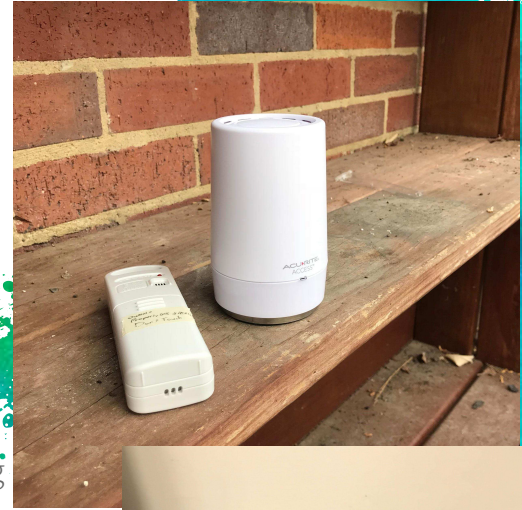
# Energy Audit

**Goal:** To determine the shortcomings with energy efficiency in our Junior/Senior High School building.

**Action:**

1. We ordered 20 digital temperature probes, 19 for classrooms and 1 outdoor
2. Also ordered 5 temperature and pressure base sensors
3. Begin recording data and continue for several months to gain a better understanding of temperature fluctuation within our almost 100 year old building.
4. Interview custodial staff and tour facility to learn about our heating and cooling systems.

**Evaluation:** The audit started in September of 2018 and will continue until that time next year. This is important because we need to measure how our school loses energy throughout all four seasons in order to understand and improve our energy efficiency. With our nearly 100 year old building and multiple heating systems. Classrooms range 20+ degrees in temperature on a given day. We would like to present our findings to the Board of Education and participate in any professional energy audits that might be completed as part of our renovation process. This has taken **20 hours** of membership time to complete to date.



# Leadership Training Day at Wright State University

**Goal:** Train members to lead and educate the youth as well as community members about energy conservation using NEED and OEP energy activities.

## Action:

1. Learn how to present a station educating students about interactive energy concepts such as...
  - a. Thermal Imaging
  - b. Sound Waves
  - c. Thermal Energy
  - d. Energy Transformations
  - e. Light Energy
  - f. Circuits
2. Learn energy related games

**Evaluation:** This was a great day bringing six brand new members to gain insight and training in the kids teaching kids model of Ohio Energy Project and NEED. Our team members gained confidence in public speaking, learned more about their assigned energy stations, and came back to school to teach the rest of our membership the stations. 40 hours total of training





# Boy Scout Night

**Goal:** Impact our community by teaching NEED and OPE energy concepts and sustainability to twenty eight members of Oakwood Cub Scout Pack 151 so that they could earn their Science Belt loop.

## Actions:

1. Determine stations to meet the belt loop requirements
2. Prepared, set-up and taught the following stations:
  - a. Energy of Chemical Reactions
  - b. Circuits 101
  - c. Ice has Energy!
  - d. Light Refraction & Reflections
  - e. Thermal Imaging
3. Help scouts understand energy principles and concepts so that they could explain them to earn their belt loop.

**Evaluation:** Through feedback from scouts as well as the scout leaders, the night was a success! All the scouts earned their belt loops and they saw that energy is fun! Fourteen members participated and donated **28 hours** of their time.



# Wright State Energy Fair

**Goal:** Impact our community by teaching energy concepts and sustainability to elementary students.

**Action:** The team took the following action steps:

1. Train members on the station/s that they would teach at Wright State Day
2. Practiced 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:** Ten 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 **150** students with our teaching and indirectly impact the **entire Miami Valley** with the media coverage of the event. Members worked collectively **40 hours**



# Regional Science Festival

**Goal:** Represent DP&L in a positive light to educate students and families about energy conservation and savings by changing behaviors and purchasing choices.

## Action:

1. Work with DP&L to set up and plan activities to be taught at the Regional Science Festival
2. Practice Teaching our station.
3. Represent DP&L by teaching energy conservation and the difference in powering the three types of light bulbs.

**Evaluation:** Friday of the festival we taught over **300** home school and regional students. Saturday's event was open to the public and we were able to reach over **1000** people spreading the message of energy conservation by teaching with the Energy Bike as well as utilizing our team's thermal camera to teach about the infrared portion of the electromagnetic spectrum. The Regional Science Festival was also on local media with the message spread to the entire Miami Valley. Membership collectively donated **35 hours** of service over the two day event.



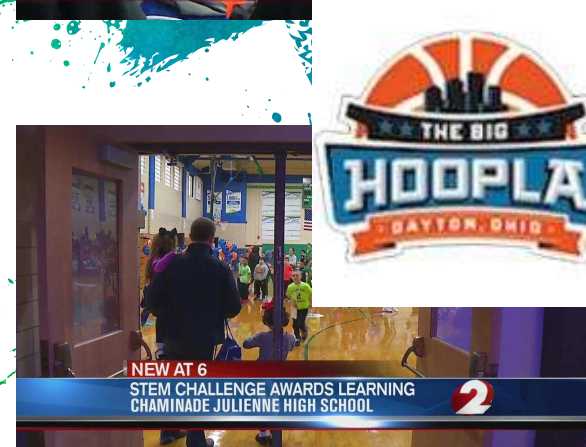
# STEM Hoopla Challenge

**Goal:** Educate our community on energy efficiency and consumption

**Action:** The Team took the following action steps:

1. With DP&L, we planned out stations and activities to teach the families about energy conservation and consumption
2. We utilized our infrared thermal camera as well as the Energy Bike

**Evaluation:** The Dayton Power and Light room was busy throughout the event with over **1000 children** and families coming through to participate in the STEM Hoopla event held in conjunction with NCAA first four games held in Dayton. Our team members gave up their day to teach the families and encourage families to change behaviors to be more energy efficient at home. DP&L also gave out LED light bulbs and had stations on programmable thermostats. This event also had media coverage to reach the entire Miami Valley. Membership collectively donated **16 hours** of service for the event.



# Smith School Energy Fair

**Goal:** In order to reach out to the younger students within our district, Energy Team hosted an Energy Fair at Smith Elementary School.

## Action:

1. Hosted various stations including
  - a. Energy Bike
  - b. Chemical Energy
  - c. Sound
  - d. Circuits
  - e. Light
  - f. Force and Balance
  - g. Energy Transformations

**Evaluation:** We were able to reach approximately **80** sixth grade students throughout the day. The students were able to experiment with a mix of different aspects of science and energy. The elementary teacher was very impressed with our work and teaching stations, that she invited us back next year! Membership collectively worked **75 hours** to deliver this event!



# National Aviation Hall of Fame STEM Day at the NMUSAF

**Goal:** Represent Oakwood Energy Team in a positive light to educate students and families about energy conservation and savings by changing behaviors and purchasing choices at the STEM day at the National Museum of the United States Air Force.

## Action:

1. Work with DP&L to secure Energy Bike to utilize during the event
2. Practice Teaching our stations
3. Teach energy conservation and the difference in powering the three types of light bulbs.

**Evaluation:** Over **5000** people attended the STEM day at the NMUSAF as part of Governor Mike Dewine's Inaugural tour around the state. We were spreading the message of energy conservation by teaching with the Energy Bike as well as utilizing our team's thermal camera to teach about the infrared portion of the electromagnetic spectrum. The event was also covered on local and state media with the message spread to the entire Miami Valley. Membership had **15 hours** of service for the days activities.



# Green Bag Giveaway

**Goal:** Promote environmental sustainability in grocery stores in the community and sharing the focus of our club this year: sustainability and reducing energy consumption and waste.

**Action:**

1. After being awarded funding for \$500 from OEP, the team decided to use the money to promote our sustainability focus.
2. We bought and designed reusable bags that we plan to donate to community grocery stores.
3. We had to work with the grocery store management to gain permission to distribute the bags.
4. We will deliver the bags to the store (Dorothy Lane Market) on Earth Day, April 22.

**Evaluation:** Although we have not held our Earth Day event yet, we anticipate it will be highly received by our community members. We plan to have our local newspaper cover the event as well as our school media specialist. This is helping to make an impression of sustainability on our entire community.

