The Bednarcik Junior High School

The Environmentalists

Aurora, IL

Advisor: Ms. Amy Truemper

Student Leaders: Abigail John, Aarin Botha, Manya Srivastava, Ava Uthe, Megan Patterson

NEED National Energy Education Development Project

Goal 1: Reduce landfill waste produced at home and school.

Goal 2: Learn about and teach others things to do to restore natural areas in our community.

Goal 3: Teach community members about ways to reduce energy use and ways to reduce their impact on the environment.

Students Can Make a Difference

The Bednarcik Environmentalists are a team of students in 6th, 7th and 8th grade who care about improving the world by addressing environmental issues. We organized several events throughout the year to teach others how to reduce their carbon footprint. NEED has given us the resources and opportunities to teach energy conservation to our school community. The different aspects of our project are as followed:

WASTE MANAGEMENT

We decided to focus on ways to motivate students to recycle but we also looked at ways to reduce single use plastics and ways to reduce landfill waste produced at school and at home.

BIODIVERSITY

We worked on several projects this year with community leaders to help restore native habitats and increase the pollinator population in our area.

COMMUNITY EDUCATION

Bednarcik had its 5th annual energy fair. We worked with district administration to promote conservation throughout the district. We planned an Earth Day Celebration and Electronics Recycling Event for our school district.

Waste Management

Goal 1: Reduce landfill waste produced at home and school.

Resources: PepsiCo Recycle Rally, TerraCycle, NEED.org, EPA Make A Difference In Your School, Illinois Department of Natural Resources, The Surfrider Foundation Keep America Beautiful, Going Blue: A Teen Guide to Saving Our Oceans, Lakes, Rivers and Wetlands by Philippe Cousteau, EarthEcho International, SHEDD Aquarium

Student Incentives: Monthly recycling raffles were held to increase items recycled. Everytime someone recycled an item, they received a raffle ticket which they could put in a drawing for a gift card. We also held lunch hour challenges and the winning hour received cell phone privilege for a week. To boost recognition for recycling we created the weekly award - Recycler of the Week which recognized one boy and one girl for recycling in the hallway or classroom. We also had recycling game days during the year.

We promoted recycling with daily announcements and social media posts.

For the 5th year, we participated in the PepsiCo RecycleRally We increased the number of recycling bins in the building and currently have a 1:1 of recycling to garbage containers.

Our team collaborated with Bernie's Book Bank. We made a homeroom competition out of it to see which class could bring in the most books to be donated. By the end of it we collected 1000 books which will provide small home libraries to over 90 children in the Chicagoland area.

Bednarcik planned to have its 4th annual spring theme recycling drive.
In week 1 we planned to collect old shirt to repurpose and make dog toys
For week 2 we planed to collect old art supplies for Crayola ColorCycle It Cycle projects.

Waste Management

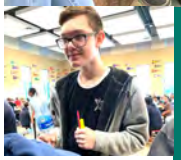
Resources: We used an Arduino with C++ Programming for construction. We used NEED.org for information on waste management issues. We used information from Electroworks, All About Trash, Museum of Solid Waste

Activities to Promote Energy Efficient Waste Management

1. The team used what they learned about circuits to successfully create an electronic recycling bin that prompted their classmates to recycle more. This caused the ratio of recyclables recycled to thrown away to go from 89:92 to 203:0
2. Team members reached out to multiple restaurants, informing them about single use plastics, creating the hashtag #pausebeforeusingstraws to promote the eco-friendly decision of saying no to single use plastics that would end up in landfills.
3. The team members also created a game in which people would try to match different things that could or couldn't be recycled. These included things like aluminum foil, empty and full water bottles, dirty cardboard, and other things many people mistook for something it couldn't be.

Goal 1:

Reduce landfill waste produced at home and school.



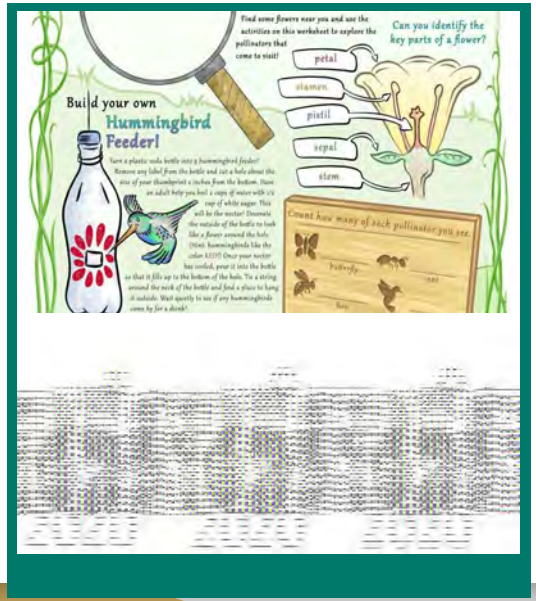
We surveyed students during the year to monitor habits. We built a sensor system for recycling to track student recycling. Below, we met with Quest Food to discuss how they could use this system in school cafeteria they service.

Biodiversity

Goal 2:
Learn about and teach others things to do to restore natural areas in our community.

Resources: NEED.org Climate Science, EarthEcho International Water by Design, NEEF Pollinator Activity, NEEF Biodiversity Resources, EPA, Oswegoland Park District, Friends of the Fox River, Aurora Ward 9 Alderman Bugg, DuPage Works.

In class, we learned about burning fossil fuels impacts global warming and climate change through activities from Climate Science. We played a game as carbon atoms going through changes in the carbon cycle. This led us to learn about how we can try reduce the impact of global warming. We thought we could make a difference by restoring the nature prairie lands.



Activities to Restore Natural Areas

1. Backyard Biodiversity Survey and participation in the BioBlitz
2. Pollinator Plant Project
3. Removal of invasive species and planting of native plants

Prairie Restoration Project

Goal 2: Learn about and teach others things to do to restore natural areas in our community.

Action Plan Pollinator Project

Pollinator Paper will help make great strides in restoring prairie land to our pollinator population. We have created greeting cards out of a recycled paper with seeds of flowers that will attract pollinators. Some of these seeds will include, but are not limited to the following: Purple Coneflower, Butterfly Weed and Black-Eyed Susan, Red Poppy and Lemon Mint. The consumer would be able to write a personalized message on the inside of the card and gift it for a special occasion, such as a birthday. The half that is planted can be put in a person's backyard or outdoor garden. Our hope is that these flowers attract pollinators and help their populations grow by providing a food source that may have been removed. Half of our profits will go towards the National Forest Foundation.

Action Plan Native Plant Project

1) School kick-off event to educate families people about environmental issues, promote home rain gardens and plant a garden at our school. We would have a demonstration that shows how these plants prevent water runoff.
2) Pass out kits that contain a variety of seeds for planting and a small manual explaining how to start their own rain garden in their backyards.
4) Our team will be watching and taking note of the decrease of water puddles around the school to help show people how the gardens work.
5) Working with our community partners, Oswegoland Park District and Friends of the Fox River we will assist with prairie plant seeding projects.
6) Create a rain garden display for the City of Aurora.
7) Develop a plan for area schools to plant a rain garden.

8th graders learned about conserving water, our most precious resource, by learning how to build and replenish aquifers, how to clean water and how to help solve problems in specific communities with a water crisis. These lessons led to students to a native plant and pollinator project.

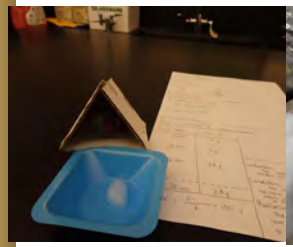
Energy Conservation STEM

7th Grade Save the Penguins Engineering Challenge
FLUOR Design Challenge
Planned Project for Spring: Solar Home Design

Goal 2: Learn about and teach others things to do to restore natural areas in our community.

We learned about how energy use impacts the environment and that machines can work without using fossil fuels.

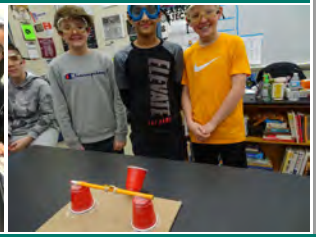
7th grade Honors Science students were challenged to create the most insulated house that would protect penguins suffering from global warming. We used knowledge from lessons on thermal energy transfer, insulators and conductors. We tested our houses out, determined the % error and then modified designs to improve our results. We then created action plans to educate our families about the issues and we raised money to help penguins being rehabilitated at SHEDD Aquarium.





7th grade Science students were challenged to create the most energy efficient machine. We used what we learned about energy transfers in our energy unit and we also built on ideas we used earlier in the year when we tried to build a machine to get Lincoln to the Memorial.



Resources: DefinedSTEM, NEED Climate Science, Intermediate Science of Energy, Lincoln in the Memorial, FLUOR Challenge on Science Buddies

Community Education

Energy Fair 2020

Goal 3: Teach community members about ways to reduce energy use and ways to reduce their impact on the environment.

An annual tradition for Bednarcik Junior High, the Energy Fair consisted of 7th grade projects on energy conservation issues along with activities, displays, and demonstrations created by the Environmentalist Team.

Environmentalist Team Tasks

1. Plan and assemble the layout and items for the Energy House Exhibit
2. Write display information and scripts for the different parts of the Energy House
3. Create flyers, posters, and announcements for the event
4. Decide on and collect raffle items
5. Prepare game stations
6. Hand out free materials and information sheets

New this year: Water Conservation and Biodiversity Issues

Over 500 people attended the fair held on March 11, 2020!

Resources from NEED: Intermediate Energy Infobook, Energy at a Glance Fact Sheets, Blueprint for School Energy Teams, Building Science, Energy from the Sun, Energy from Wind
Additional resources: DefinedSTEM, EnergyStewards, Illinois Solar and Wind Schools, Illinois Energy Learning Exchange Library, Think Green NASA JPL, SaveOnEnergy, ReliantEnergy, CEMAST Smart Grid

Energy Conservation

Energy Fair 2020- Museum Exhibits

Goal 3: Teach community members about ways to reduce energy use and ways to reduce their impact on the environment.

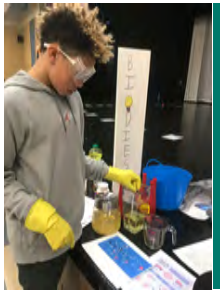
Resources: NEED.org, Smart Grid for Schools, IL Learning Resource Exchange, Solar for Schools, KidWind

The museum exhibits at the energy fair educated students and community members about different aspects of energy such as ways it can be produced, ways it can be used, and ways to save energy. NEED has provided so many useful materials to teach energy in a fun way. 7th graders had a blast learning about energy transfer, how we get and use natural resources as forms of energy, and how that impacts the Earth.

Adrian explains the parts of the energy grid

Averey explains home heating and ways to improve insulation.

Julia talks about the careers involved in natural gas distribution



Jacob shows how biofuels can be used as an energy source.

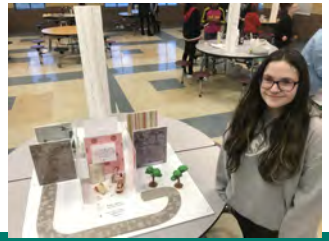
Colin explains how fossil fuels are used to generate electricity.

The natural gas safety crew.

Angie explains to community members about the smart grid.

Nathan teaches a group of elementary students about wind turbines.

Cooper demonstrates how using a smart meter can save money.



Audrey teaches families how to be safe with electrical appliances.

Energy Conservation

Energy Fair 2020- Energy House

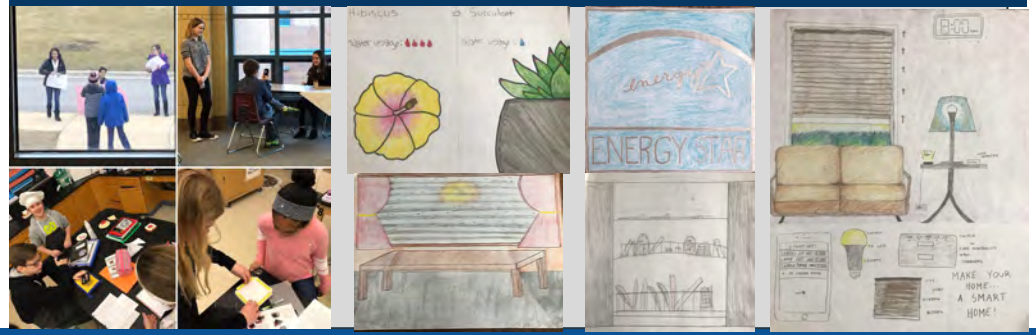
Goal 3: Teach community members about ways to reduce energy use and ways to reduce their impact on the environment.

Students constructed a model of an energy efficient home. Students used the kilowatt meter to show families common appliances with vampire energy and how to stop this waste of energy. They focused more on how to conserve heat energy in the home this year. The Energy House also showed guests ways to conserve water, reduce single use plastics and how to upcycle materials.

A student explaining ways to save energy in the kitchen

A student displaying some tools in our audit box as well as ways to save energy at home

Students made a series of videos about ways to reduce energy use in the home and with transportation. Students also made an art gallery of energy conservation tips.



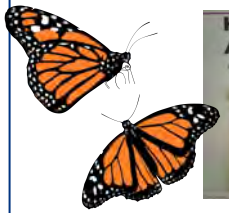
Resources: NEED Energy House, This Week in Conservation, ComEd Ways to Save, Resource Kit.org, RecycleRally, EPA.gov

Getting Involved in the Community

Goal 3: Teach community members about ways to reduce energy use and ways to reduce their impact on the environment.

The Environmentalist Team has been invited and reached out to several events and programs at other schools and around the community to help clean up the Earth and to help spread awareness. Some of these include:

- Bernie's Book Bank Drive and Volunteer Session
- Keep America Beautiful Recycle Bowl
- SHEDD the Straw Campaign with SHEDD Aquarium
- River Cleanup and Water Quality Testing with Friends of the Fox River
- Beach Cleanup and Prairie Restoration Project with Great Lakes Action Committee - Montrose Harbor Bird Sanctuary
- Monarch Butterfly Garden and habitat restoration
- Oswego East School Clean Up



Check out our Instagram and Twitter Pages:

TRUSCIENCECLASS

Clean Green Recycling Machine

Getting Involved in the Community

The Environmentalist Teams worked on several projects this year:

- Aurora-Ward 9 Annual “Clean-Up The Streets” Day
- District Administration Building Energy Audit
- SD308 IT Department Community Recycling Event
- Education families on energy conservation at PrairieFest
- #pausebeforeusingstraws campaign at local restaurants
- WE Walk for Water Campaign with Oswego High School promotes water conservation & raises funds for global access to clean water.

Goal 3: Teach community members about ways to reduce energy use and ways to reduce their impact on the environment.

TERRACYCLE

Fox Valley

WE walk for water

EARTH DAY

EARTHECHO Water Challenge

PrairieFest
OSWEGOLAND PARK DISTRICT

Energy Conservation Special Projects

Goal 3: Teach community members about ways to reduce energy use and ways to reduce their impact on the environment.

January 2019 - We learned how plastic pollution in our water sources is really impacting the environment. We did a lot of research on this issue and realized recycling is just a small part of fixing this problem. As part of the National Geographic Challenge, we research the problem and designed a robot that can be used to pick up plastic from our area retention ponds and slow flowing water ways.

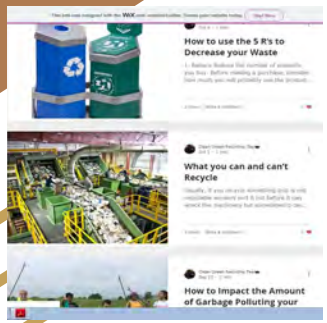
April 2019 - We had planned an Earth Day event with different booths talking about biodiversity issues, using native plants, and energy conservation tips. This event would teach people about energy and water conservation issues to kick off our WE Walk for Water campaign to raise funds to bring clean water to a community in South Africa..

May 2019 -Our plan was to complete a water quality survey of the Fox River for EarthEcho International and hold a river clean up day. We also plan to work with the park district on removing invasive species and doing native seeding projects.

At the radio station 95.9FM, The River, to record a 5 minute segment informing the community about our mission, ways to learn more about reducing single plastic use and upcoming events such as the No Straws Weekend and the Energy Fair..

Telling students & staff about our projects and ways students can make a difference at an all school assembly with about 700 people in attendance.

Visiting restaurants and libraries to educate staff on single-use plastic
We asked them to implement our ideas to decrease waste, and to hang up our flyers to educate the public.



We created our own website and an app to track energy use.
https://jensiecat.wixsite.com/

Project Summary

The Environmentalist Team at Bednarcik Junior High leads recycling and energy conservation projects at school. The team consists of 6th, 7th, and 8th graders. This year, in addition to energy conservation, the team focused on issues involving biodiversity which introduced us to many community partners who were excited to hear about our work. Our current long term projects are pollinator paper and native plant prairie restoration.

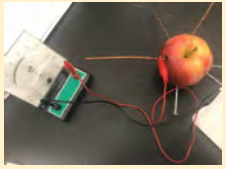
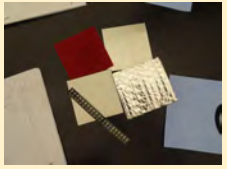
One of our highlights this year was building the electronic sensor for the recycle bins. This really motivated students to recycle and we learned so much about electronics and programming. We also developed an app EcoGoals to go along with it.

One of our most important lessons learned this year is that recycling is just a small part of the solution. The bigger issue is the overuse of single use plastics and in the second semester we began to look for ways to reduce single plastic use. This led to our #pausebeforeusingstraws campaign which several restaurants supported.

The team has been able to have new opportunities, experiences, and interactions that have helped us grow as leaders and has further instilled in us the desire to improve our environment. With each new challenge comes a new excitement for recycling and energy conservation. Our team is very proud of all we have accomplished this year!

Thank you for the resources to help us understand energy concepts. We learned how to collect and analyze data while having fun.



"From my experience with the NEED program, I've learned so much about how to use less energy and teach others to do the same. I know some people don't know what can and can't be recycled, but NEED fixes that. I'm happy I can teach others the proper ways to help save our planet." - Megan Patterson

NEED has not only shown me what we can do as individuals to conserve energy, but it has taught me what it means to be part of a team. That we must not go against the people in this world who are unaware of their impact, but rather we can help to educate them so that we can change the world *with* them."

-Ava Uthe

The Environmentalists would like to thank all of our sponsors, especially the NEED and ESP programs for providing resources to help us learn about energy. We are so grateful for how these programs have helped us learn about our world and how they have inspired us to teach others how they can make a difference.

NEED National Energy Education Development

RECYCLE RALLY

ESP energizing student potential

SD308 COMMUNITY UNIT SCHOOL DISTRICT

AURORA ILLINOIS CITY OF LIGHTS