

2017-2018 Energy Project

GIRLS JUST WANT TO HAVE FUN!

By: River Valley High School Women In Science

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We went outside of and inside our community to learn about and teach others how to save energy. We started with a student survey, from which we learned our students love going to the Zoo and to Cedar Point. We used this to look for ways these large companies could save energy.

To learn about energy, we participated in the energy fair, read many articles, talked to experts from Columbia Gas and Cedar Point, and visited the Columbus Zoo. From this, we learned how to conduct energy audits. We did audits at home and at school, then presented the school results at a staff meeting. We set up a booth at our Wellness Night, sharing information about different light bulbs and the amount of energy they use. Finally, we invited community members to allow us to do energy audits in their homes.

Overarching Goal:

Our overarching goal is to educate others about energy efficiency at home, at school,in the community, and at large recreational facilities!

Individual Goals Leading to Our Overarching Goal:

1. Complete Group training/Energy Fair
2. Survey RV students to find their personal preference of recreational facility. The top two results were Cedar Point and the Columbus Zoo
3. Discussion with big companies - The Zoo and Cedar Point
4. Develop Our energy plan- small to large
5. Visit the Columbus Zoo looking for how they implemented energy saving plans.
6. Demonstrate ways to save energy at RV Wellness Night
7. Conduct and share results of an energy audit at our School
8. Conduct Energy Audits of homes in our community

Group Training:

The Ohio Energy training the six of us attended taught us about energy sources and how we use them daily. This prompted us to think about conservation of energy and how we could conserve energy through our everyday life.



Pictures from Training and Energy Fair



In this picture we are being taught how to use and read a thermal imager.



The Watts Up station we learned about energy usage, and how to use a Kill-A-Watt meter.



In this picture we were reading the directions that went along with this station.

In this picture we were balancing birds on a finger. This had to do with friction and center of gravity.



In this picture we are using Snap Circuits. This is a prototype station which will be used at future energy fairs.

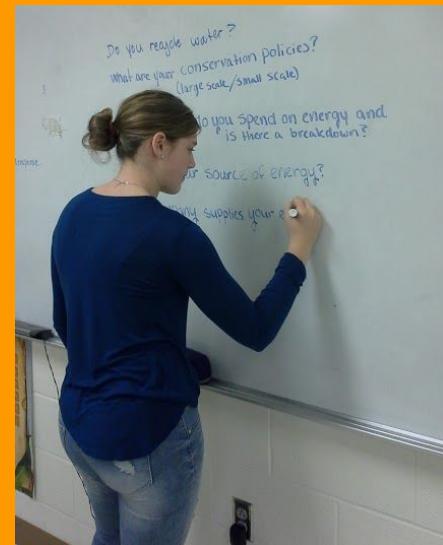
Pictures from the Energy Fair



We Discussed Energy Matters with Cedar Point -

11/7/17

This showed Mindi preparing for her conversation with Cedar Point. They use variable drive motors on most rides, and switch out lighting to LED lights whenever possible. Even so, they consume 45 mega-kilowatt hours of energy, in about 6 months! The advisors and Mindy discussed wind generators, but because Cedar Point is only open half the year, they are not a good candidate for wind power.



Columbus Zoo

(two leaders attended)



The Zoo conserves water by recycling non-potable water, using it to wash cages and sidewalks. The zoo uses geothermal energy to heat the water in all of the pools. They conserve electricity by using mirrors to direct sunlight into buildings. They have also swapped out lighting by installing LED lights.



RV Wellness Night (service project 1)

Riding the Energy Bike while running lights and fans

Two leaders presented the energy bike at our local Wellness Night. They promoted conservation of energy by comparing lighting, while getting physically fit! More than 100 people viewed the display, with dozens of children participating.



Energy Audit at the School

Women in Science presentation: Julia Noschang, LEED AP and Justin Kale, CEM



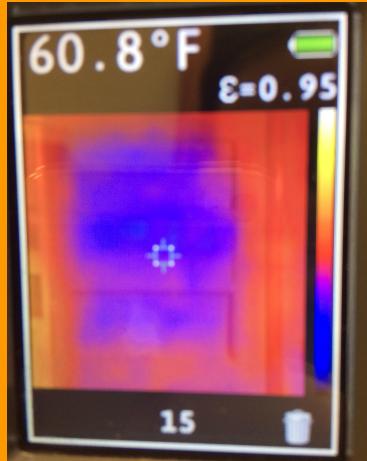
2nd service project for our school -

In February, we discussed energy audits with experts Justin Kale and Julia Noschang from Energility and Columbia Gas and LEED. This inspired us to conduct our own energy audits at our home and at our school. We did these audits in February and March.

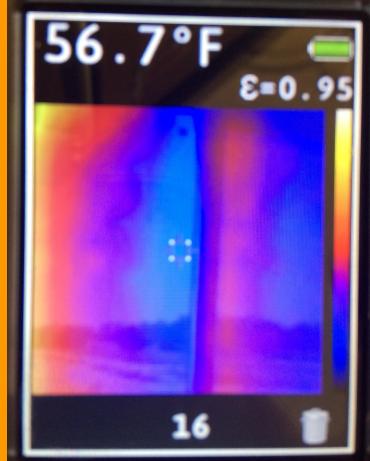


Energy Audits of Our Homes

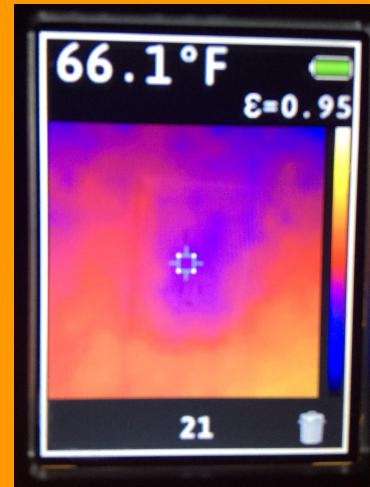
Each of us took the thermal imager to our house for the day, and we captured pictures of places where our homes tend to lose energy. We shared these results with our parents.



The first picture is a door with 3 windows in the middle, and how cold is coming in through the windows in it.



This is a picture of a big window right behind a sink, and how cold air is coming in.



This is a picture of a wall outlet, and how a little cold air is getting out

High School Energy Audit

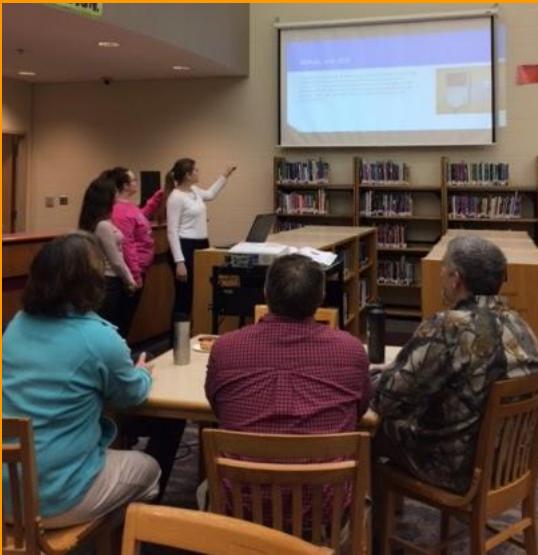
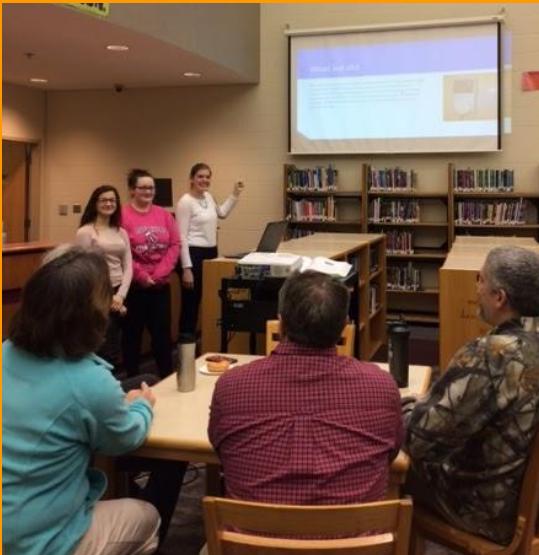
River Valley High School Data

	A	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1														
2				staff room 100 room 115 room 227	workroom	sums	average kilowats used	cost per kilowatt-hour	weekend hours	weekend and evening hours	weekend savings per week per device	weekend and evening savings per week per device	savings for all weekends and evenings in school year for 1 device	savings for all weekends and evenings in school year for all the counted devices
3	mini fridge		1			6	0.07	0.1	48	128	\$0.34	\$0.90	\$32.40	\$194.40
4	Refrigerator					4		0.1	48	128				
5	computer	4	1			74	0.015	0.1	48	128	\$0.07	\$0.19	\$6.84	\$506.16
6	coffee maker	1	1			6	0.00085	0.1	48	128	\$0.00	\$0.01	\$0.36	\$2.16
7	plug in air freshener		1			9	0.0055	0.1	48	128	\$0.03	\$0.07	\$2.52	\$22.68
8	tv					2		0.1	48	128				
9	lamps		2			5		0.1	48	128				
10	microwave		1			12	0.0018	0.1	48	128	\$0.01	\$0.02	\$0.72	\$8.64
11	computer cart	1	1	1		14	0.092	0.1	48	128	\$0.44	\$1.18	\$42.48	\$594.72
12	speakers					12	0.0016	0.1	48	128	\$0.01	\$0.02	\$0.72	\$8.64
13	LCD projector					12		0.1	48	128			\$0.00	
14	printer	1			1	11	0.0135	0.1	48	128	\$0.06	\$0.17	\$6.12	\$67.32
15	decorations					6		0.1	48	128				
16	hood					1		0.1	48	128				
17	Pencil Sharpener	1	1			7	0.0031	0.1	48	128	\$0.01	\$0.04	\$1.44	\$10.08
18	electric hole punch					3		0.1	48	128				
19	wifi hub					6		0.1	48	128				
20	heater					13		0.1	48	128				
21	Stereo					3		0.1	48	128				
22	charger	1				6		0.1	48	128				
23	Toaster		1			4		0.1	48	128				
24	strip			1		6		0.1	48	128				
25														\$1,414.80
26														

Three of us audited 36 classrooms and found that unplugging after school and on weekends would save about \$1,415 annually.

Energy Audit Presentation to the High School Staff -3/16/18

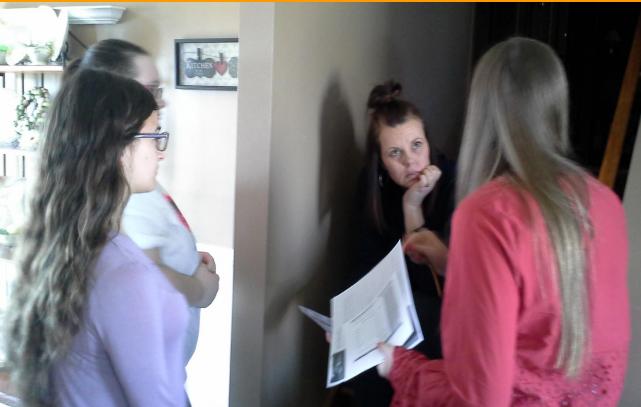
We explained how we did the energy audit. Staff wanted to know our monthly bill, \$30,000, and other ways we could save energy at school -



putting up curtains, installing motion detectors for classroom overhead lights, slowing the air handlers in unused areas during off-peak time periods, switching fluorescent bulbs to LED's, etc. Sophia, Carla and Mindi conducted the presentation.

Energy Audits at Homes in our Community -Service Project 3

Conducted by Sophia, Carla and Mindi



In this first picture we were discussing the results of the energy audit with the homeowner. We gave them a sheet that summarized these results.



In the second picture we were testing the heat of the homeowner's hot water. Their hot water tank is right around 120 degrees. This house could have used some pipe insulation.



In this picture we were using the thermal imager to see the temperature difference from the top of the wall to the bottom.

Summary of Our Energy: Small to Large

At home: Using thermal imaging, we did an audit of our own home. We installed weatherstripping to save heat. We found it would save more energy to switch to Energy Star appliances, unplug when not in use, and switch lighting to LED whenever possible.

At school: We audited several classrooms and made recommendations to each teacher on how they could save energy.

In the community: We went to a few homes around the community to conduct home audits and to tell them what they could do to conserve energy. We also went to the School's Wellness Night to promote what we found through home audits, and what an average person can do to save energy in their home.

At the Columbus Zoo and Cedar Point: We went behind the scenes of the Columbus Zoo, and we talked about all that they do to conserve their energy, and asked how they do so. They also gave us tips on how to conserve energy. When we went to the zoo, we learned about the "2 Up! 2 Down!" program. It states that during the winter, you will set your thermostat 2 degrees lower than what it is normally set at, and during the summer, you will keep your thermostat 2 degrees warmer than normal. All of this is so that we can try to reduce global warming.
We had planned to go to Cedar Point, but decided that all of our suggestions are already being used there.