

Westerville Energy Education Partnership

A collaboration between:

- Westerville City Schools
- City of Westerville Electric Division
- Ohio Energy Project

Project Advisors:

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Picture: Joel, a Mark Twain Elementary 2nd grader, visits the Electric Division Open House during Public Power Week





Partnership Goal: To impact students, teachers, homes and the community through excellent energy education programs

Westerville City Schools: The most outstanding teachers & students in Ohio

City of Westerville Electric Division: Program funding partner and community outreach experts

Ohio Energy Project: NEED's state affiliate in Ohio

Goal #1 Student Leadership

To provide students with the opportunity to receive training in teamwork & communication skills and hands-on energy education.

Energy Content Activities:

- Teamwork Games-Rock/Paper/Scissors Cheerleading, This or That, Human Calculator
- Energy Explorations-Light, Sounds, Forces & Motion
- Energy Carnival-Light & Sound Jenga, Forces & Motion Connect 4

Student Leadership:

- 101 middle school student leaders trained
- 206 high school student leaders trained

Resources:

- Energy Carnival & Explorations
- Ohio Energy Project Staff

Evaluation:

200 student leaders completed pre & post polls to survey their confidence in leadership skills. Students reported their confidence level teaching other students about energy at 4.8 (1-5 Likert scale; 1=not at all confident; 5=very confident)

Picture: Westerville South students learning to teach sound pitch.



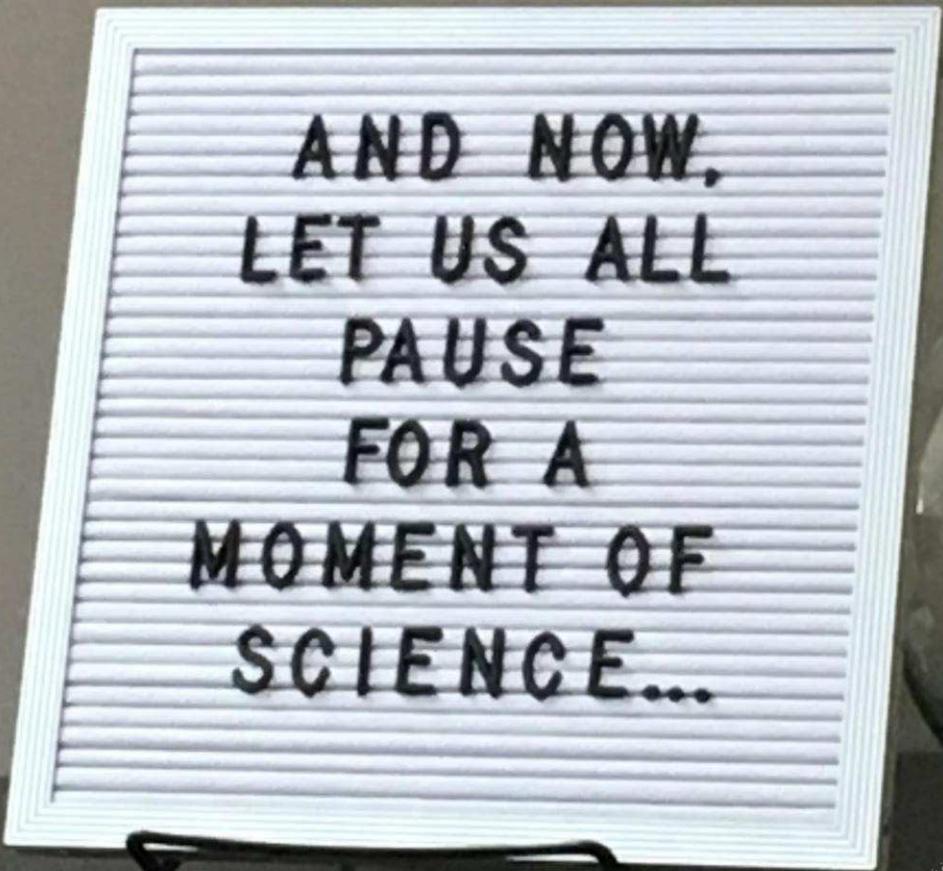


Kids Teaching Kids

307 middle and high school student leaders were trained at 9 Youth Leadership Summits. These student leaders facilitated programs at all 14 Westerville elementary schools. Every 5th grader in the district had the opportunity to participate.

Kids Teaching Kids...now teaching kids! Over 75% of these students leaders had participated in the program themselves, as a 5th grader.

Pictures: Leaders practicing energy explorations and carnival games at leadership summits.



AND NOW,
LET US ALL
PAUSE
FOR A
MOMENT OF
SCIENCE...

Energy Content Activities:

- All 14 Westerville elementary schools hosted a 5th grade energy day. Students participate in 60 minutes of hands-on energy activities.

Student Leadership:

- Programs were facilitated by leaders from all 7 Westerville middle & high schools.

Resources:

- Light, Sound, Forces & Motion Energy Explorations
- Energy Carnival-Light & Sound Jenga, Forces & Motion Connect 4

Evaluation:

- 1,062 fifth graders learned about energy
- The average gain in knowledge on pre vs post polls was 33%

Picture: Sign posted in the classroom of Bethany Morris, 5th grade science teacher at Robert Frost Elementary

Goal #2 Fifth Grade Energy Days

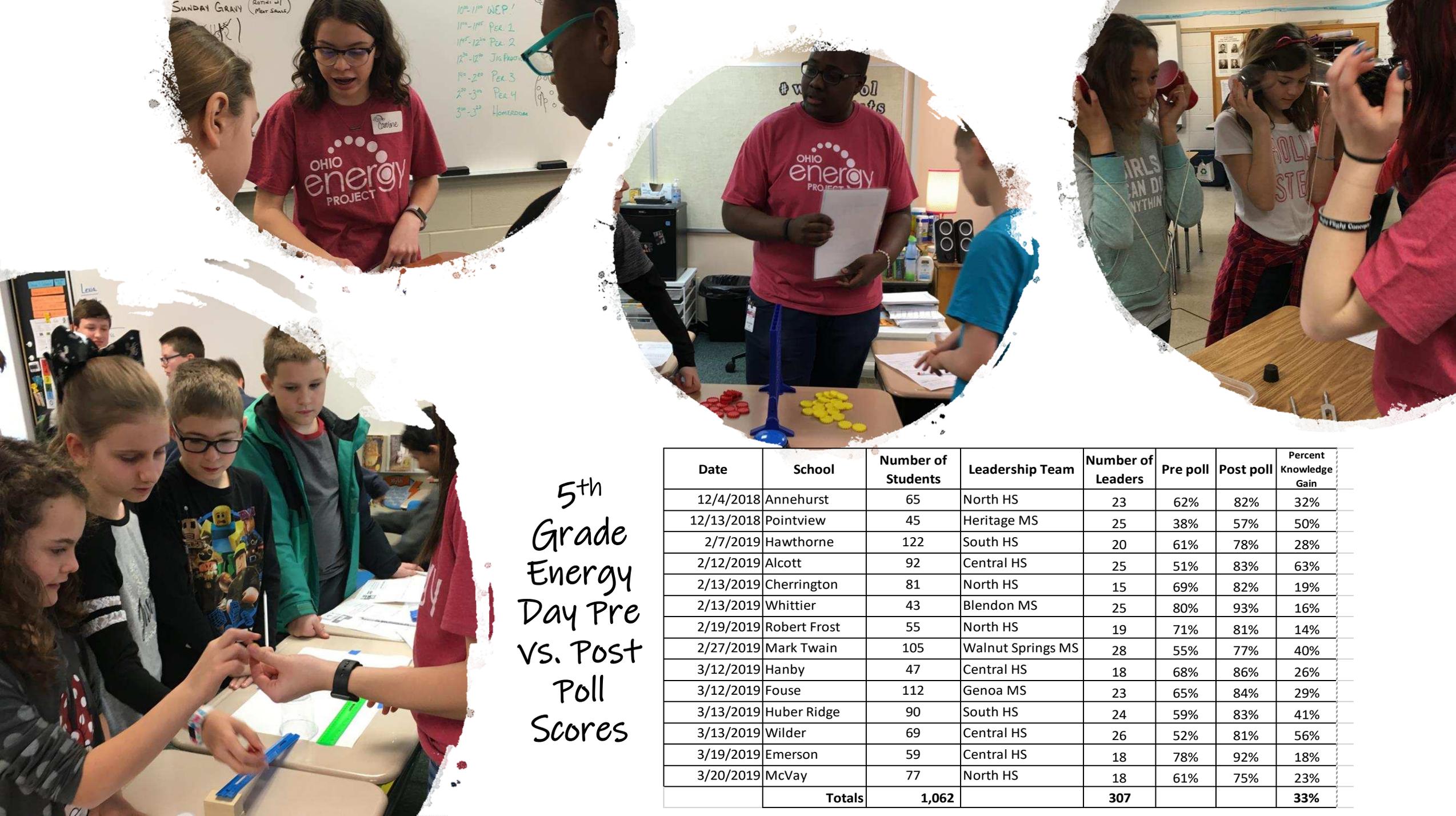
To provide every 5th grade student and teacher an excellent energy education program facilitated by student leaders.



5th Grade Energy Days

Pictures (clockwise from top left):

- Hawthorne Elementary students investigate light reflection
- A student leader from Heritage Middle School explores sound pitch at Pointview Elementary
- Westerville North High School leaders work with Annehurst 5th grades using light snap circuits
- 5th graders investigate the properties of forces & motion led by a Westerville South High School student leader



5th
Grade
Energy
Day Pre
vs. Post
Poll
Scores

Date	School	Number of Students	Leadership Team	Number of Leaders	Pre poll	Post poll	Percent Knowledge Gain
12/4/2018	Annehurst	65	North HS	23	62%	82%	32%
12/13/2018	Pointview	45	Heritage MS	25	38%	57%	50%
2/7/2019	Hawthorne	122	South HS	20	61%	78%	28%
2/12/2019	Alcott	92	Central HS	25	51%	83%	63%
2/13/2019	Cherrington	81	North HS	15	69%	82%	19%
2/13/2019	Whittier	43	Blendon MS	25	80%	93%	16%
2/19/2019	Robert Frost	55	North HS	19	71%	81%	14%
2/27/2019	Mark Twain	105	Walnut Springs MS	28	55%	77%	40%
3/12/2019	Hanby	47	Central HS	18	68%	86%	26%
3/12/2019	Fouse	112	Genoa MS	23	65%	84%	29%
3/13/2019	Huber Ridge	90	South HS	24	59%	83%	41%
3/13/2019	Wilder	69	Central HS	26	52%	81%	56%
3/19/2019	Emerson	59	Central HS	18	78%	92%	18%
3/20/2019	McVay	77	North HS	18	61%	75%	23%
	Totals	1,062		307			33%

5th Grade Energy Days...a Crap Ton of Fun

5th grade students complete pre/post polls to measure student knowledge, but the last question asks, "How much fun do you have learning about energy?" A lot of fun wasn't strong enough for Grady, from Alcott Elementary. He wrote in, "A crap ton of fun." Now that's a whole lot of fun.

Grady IOE

OHIO energy PROJECT

POST~POST~POST~POST~POST~POST~POST

Answer the questions to the best of your ability by CIRCLING the best answer.

- The bending of light as it passes from one medium to another is called _____.
a. reflection b. detection c. refraction d. investigation
- When forces are _____, there is no motion or change in speed or direction.
a. increasing b. decreasing c. kinetic d. balanced
- The frequency of a sound wave is called its _____.
a. pitch b. vibration c. catch d. soprano
- Sound waves travel best in a _____.
a. gas b. liquid c. solid d. vacuum
- In an instrument, as the string or column of air gets shorter, its pitch becomes _____.
a. louder b. longer c. higher d. lower
- A _____ is a push or pull in a direction.
a. car b. force c. ball d. motion
- The motion of an object depends on force and _____.
a. length b. height c. mass d. structure
- For a sound to be produced, there must be a vibration and a _____.
a. instrument b. speaker c. vacuum d. medium
- Light always travels in a _____ line.
a. circular b. curvy c. straight d. zigzag
- What force is acting on your pencil pulling it towards the Earth?
a. gravity b. momentum c. nuclear d. electrical
- How much fun do you have learning about the science of energy?
a. No fun at all b. A little fun c. Quite a bit of fun d. A lot of fun
E. A crap ton of fun



	Pre-poll	Post-poll
No fun at all	7%	2%
A little fun	20%	10%
Quite a bit of fun	37%	28%
A lot of fun	36%	60%

Chart: District-wide results from "fun" question.

Pictures left to right:

Whittier Elementary teachers, Amy Godwin & Heather Alexander, twinning on energy day; OEP staff member Sue Tenney with her niece, a leader at Walnut Springs Middle School, Westerville Central leader, Precious, with her 5th grade sister at Hanby Elementary



Goal #3 Excellent Opportunities for Energy Efficiency Education

To provide teachers & students with opportunities to save energy at home and school

Energy Content Activities:

- Professional Development Workshops for 3rd, 4th and 7th grade teachers
- Development of energy materials for intervention classes
- 7th Grade & AP Environmental Science Home Efficiency Kits
- 5th Grade Home Light Bulb Audit
- 6th Grade Global Trading Game
- Central Ohio Energy Sources Tour

Student Leadership:

- 1,350 students installed a home efficiency kit. These students impacted 4,000 family members. Kids Teaching Kids is expanded into Kids Teaching Families

Resources:

- NEED Curriculum-Infobooks (all levels), Energy Stories & More, Global Trading Game
- OEP Curriculum-e³ Smart (energy efficiency education)

Evaluation:

- 23 educators participated in one of 5 professional development workshops
- 1,350 7th graders & AP Environmental Science students took home efficiency kits saving an estimated 584 mega-watt hours.
- 818 fifth graders completed a home light bulb audit



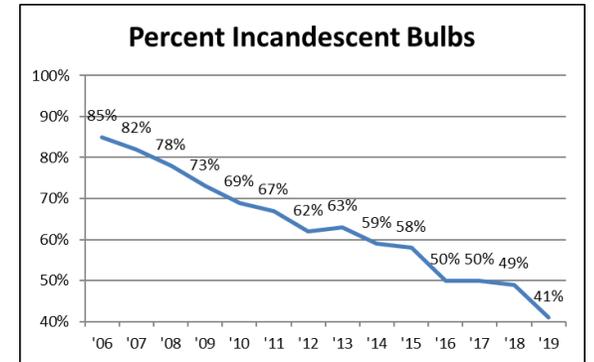
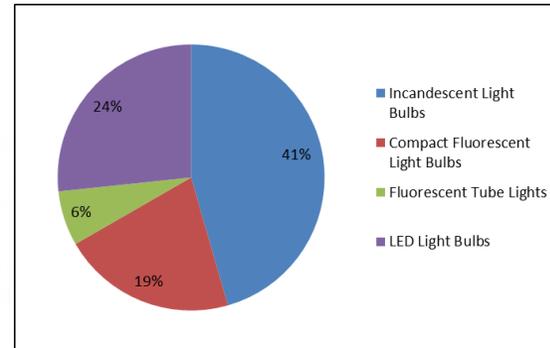
Picture: 7th grade teachers explore electricity using snap circuits



Pictures (top to bottom): 7th grade science teacher, Amber Northern, participates in OEP's Energy Tour-site pictured Ohio State University High Voltage Lab; 6th grade social studies students at Blendon Middle School participate in NEED's Global Trading Game.

5th Grade Light Bulb Audit

For 14 years, 5th graders have been conducting a home light bulb audit. The future of Westerville is bright...and a lot more energy efficient in 2019!



School	# of students	# surveys returned	# IL Bulbs	# CFL Bulbs	# LED Bulbs	# Tube Bulbs	# Total Bulbs	# Homes with CFL	% Homes with CFL	# Homes with LED	% Homes with LED	% Inc. Bulbs	% CFL Bulbs	% LED Bulbs	% Fluor. Tube Bulbs
Alcott	98	94	2,356	930	1775	190	5251	84	89%	72	82%	45%	18%	34%	4%
Annehurst	65	49	716	342	844	114	2016	38	78%	40	82%	36%	17%	42%	6%
Cherrington	83	68	868	431	566	138	2003	53	78%	42	62%	43%	22%	28%	7%
Emerson	64	47	738	523	796	161	2218	42	91%	33	72%	33%	24%	36%	7%
Fouse	121	104	3,240	1,042	1,967	341	6590	82	79%	86	83%	49%	16%	30%	5%
Hanby	49	32	408	207	310	61	986	26	81%	23	72%	41%	21%	31%	6%
Hawthorne	122	46	395	254	261	100	1010	36	80%	25	56%	39%	25%	26%	10%
Huber Ridge	90	62	600	274	367	90	1331	45	73%	39	63%	45%	21%	28%	7%
Mark Twain	115	62	807	514	1359	248	2928	50	81%	52	84%	28%	18%	46%	8%
McVay	85	78	1,348	626	1,199	136	3309	56	73%	64	83%	41%	19%	36%	4%
Pointview	48	33	623	264	265	55	1207	28	85%	22	67%	52%	22%	22%	5%
Robert Frost	64	48	833	446	1309	138	2726	39	81%	42	88%	31%	16%	48%	5%
Whittier	43	22	267	219	286	88	860	20	91%	16	73%	31%	25%	33%	10%
Wilder	77	73	742	446	515	115	1818	48	66%	35	48%	41%	25%	28%	6%
Totals	1,124	818	13,941	6,518	11,819	1,975	34,253	647	79%	591	73%	41%	19%	35%	6%



Goal #4 Westerville Electric Division School & Community Outreach

To develop a relationship with students, their families and the community to promote efficiency, electricity safety and careers in energy.

Energy Content Activities:

- Open House at Westerville Electric Division during Public Power Week
- Electricity safety & careers in energy presentations at schools
- Careers Day at Walnut Springs Middle School
- Arbor Day Celebrations with School district 5th graders
- Community wide incandescent Christmas light recycling

Student Leadership:

- 1,200 5th graders received pine seedlings on Arbor Day to plant around their home.

Resources:

- John Friley, Westerville Electric Division Safety Specialist
- Westerville Electric Division Facility & Staff
- Energy Bike

Evaluation:

- 4 electric safety/energy careers presentations impacted 290 4th grade students and 12 teachers
- 4 trees were planted at Arbor Day Ceremonies with 5th grade classes impacting 301 students and 11 teachers
- 60 middle school students learned about energy industry opportunities at careers day.
- 175 community members attended the Westerville Electric Division's Open House
- 1,852 pounds of incandescent Christmas light strands were recycling by Westerville community members

Picture: OEP Executive Director, Shauni Nix, gets a lift in a bucket truck during the Open House



Community Open House

During Public Power Week in October 2018, the Westerville Electric Division hosted a Community Open House. 175 Westerville residents attended.

Pictures (clockwise from top left): Up in a bucket truck; a Westerville family learns how the Electric Division maintains traffic lights; a future home owner learns about light bulb efficiency by riding the Energy Bike; apprentice line workers train a new recruit, bucket truck rides on a clear fall Ohio afternoon





At the Schools: Arbor Day and Electricity Safety & Careers Days

Pictures (clockwise from top left):

- Students celebrate Arbor Day with artwork
- Westerville Electric Division Arborists demonstrate utility tree trimming
- Annehurst Elementary 5th graders read the history of Arbor Day
- John Friley, Westerville Electric Division Safety Specialist, shows Robert Frost Elementary 4th graders some safety equipment
- 4th graders see how line workers use a bucket truck



Outreach to the Westerville Community

- The Electric Division recycled 1,852 pounds of Christmas lights and 1,000 pounds of batteries during the 2018 holiday season.
- 2,500 LED light bulbs were distributed to community members at events.
- Community members recycled 160 refrigerators reducing energy consumption by 88,000 kWh/year.
- Electric Division staff participated monthly in the Westerville Farmers Market and 4th Friday Street Festivals.

Pictures (top to bottom): Line workers talk with kids at 4th Friday; Kenny, utility arborist, educates participants in Citizen's Academy; battery & Christmas light recycling bins outside the Electric Division.





It's Time to Celebrate!

The Westerville Energy Education Partnership will be celebrating a year of excellence at Ohio Energy Project's Youth Energy Celebration on May 8th, 2019 at the Columbus Zoo & Aquarium.

Students from Westerville North & South High Schools serve as "Safari Guides" for the event leading 400 of their peers on the WILD side.

Picture: WNHS & WSHS Safari Guides at the 2018 Youth Energy Celebration.